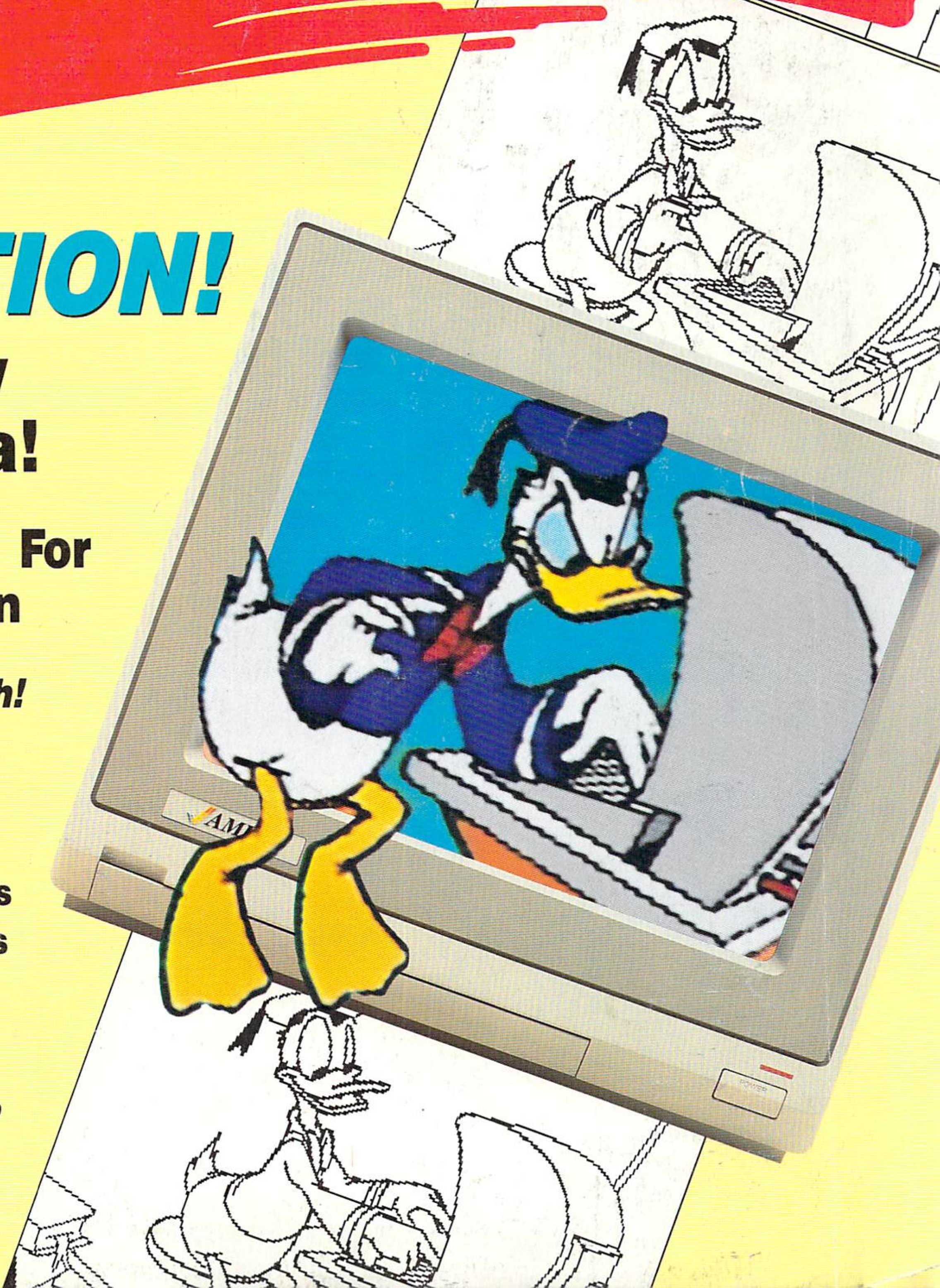
EXCLUSIVE—DISNEY "STUDIO" —p. 18



AMIGA WORLD



ANIMATION!

Walt Disney Goes Amiga!

3 Essential Tips For Better Animation

Finish With A Flourish!
12 Top Utilities

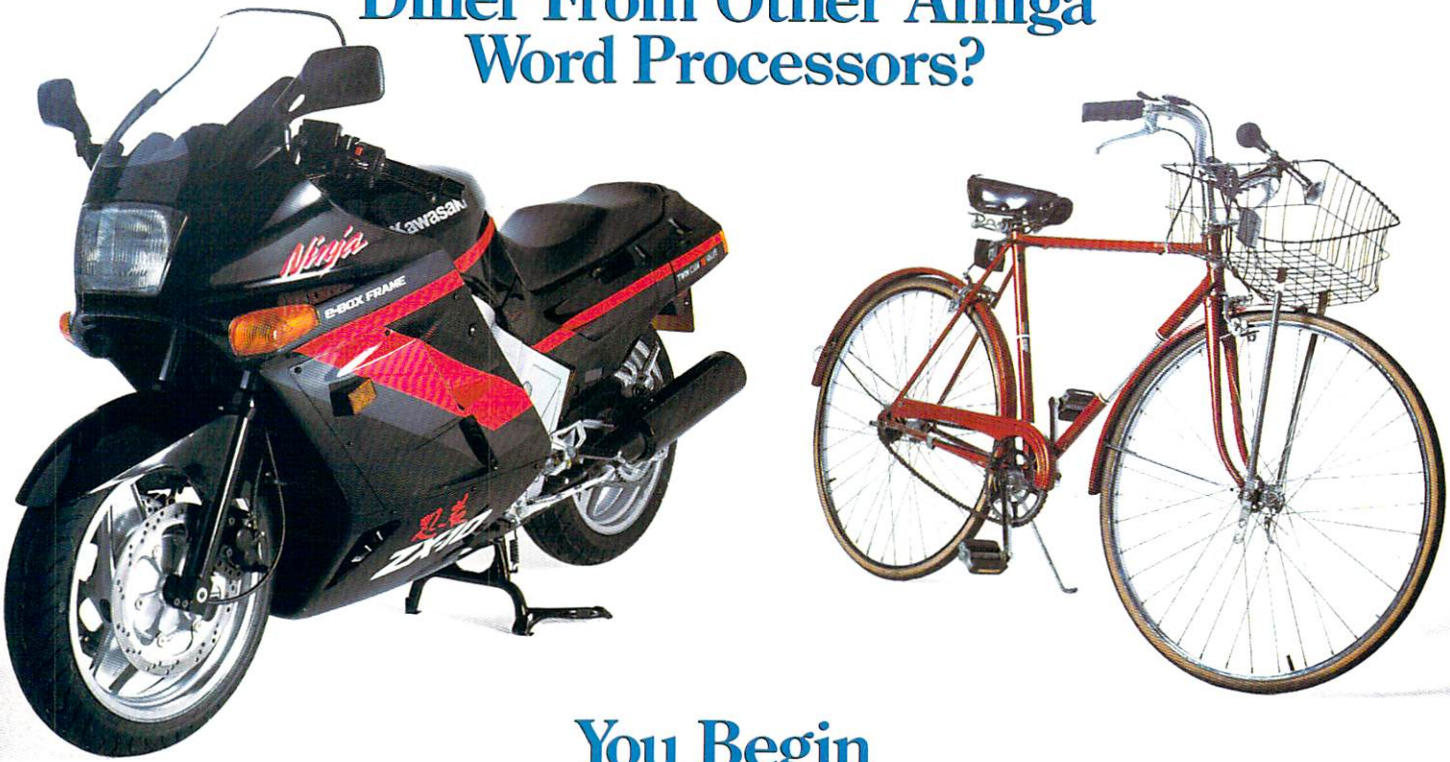
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- **7 Education Programs**
- **2.0's New ColorFonts**
- **Tips on Scripts**

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An IDG Communications Publication

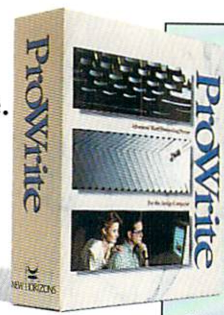
How Does New ProWrite 3.0 Differ From Other Amiga Word Processors?



You Begin To Get The Picture.

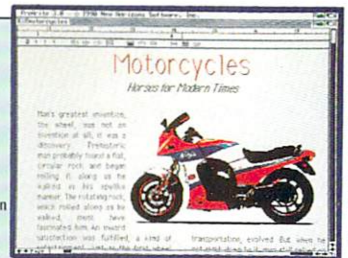
Beneath Its Elegant Design Lies A Word Processing Powerhouse.

Ease into the solid comfort of the ProWrite environment. Zip in your text and briskly format with intuitive menu and ruler controls. Now slip into high gear using the power of keyboard commands. Deftly cut, copy and paste on the fly, knowing the formidable 100,000-word spelling checker is checking as you type, and the vast thesaurus is standing by with over 300,000 cross references to fine-tune your ideas. Graceful multiple columns are at your fingertips with choice of snaking or parallel text flow. If you're really into performance, you can tackle tedious tasks with the touch of an F-key using macros. For you power users, the AREXX port awaits you. And ProWrite's print merge feature eagerly churns out those form letters.



So Intuitive, So Responsive, You've Got To Experience It To Believe It.

Your thoughts pour effortlessly onto the screen, then just as fluidly out to your printer, virtually unaware of anything between you and the printed page. (After all, what good are all those features if they're a distraction to use?) Even your swiftest typing can't outrun it. Wrap your text around a graphic and you're ready for the home stretch. Now it's time to print and you've got control over your printer's dot density, aspect ratio, and paper size. And ProWrite can print your printer-resident fonts with graphics in Pica, Elite, Condensed, and Wide—all on the same page. With ProWrite's flexibility, you can smooth out any rough spots—no matter what kind of printer you have.



With all these performance features and more, ProWrite stands in a class by itself as your power performer. And best of all, it stands on the shelf now at your favorite store.

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- Spelling checker with 100,000 word dictionary
- Spell check all at once or as you type
- Multiple columns with snaking or parallel text flow
- Thesaurus with over 300,000 cross references
- Print merge
- Import any IFF or HAM pictures
- Wrap text around pictures
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- Macros, when used with AREXX
- AREXX port
- Hyphenate words with soft hyphens
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- Defineable decimal tab alignment character
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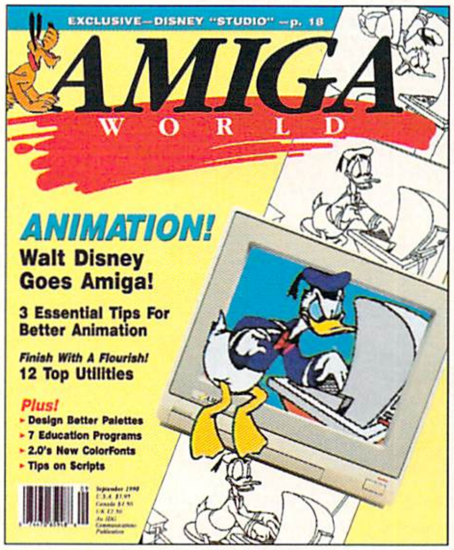
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VOLUME 6, NUMBER 9 SEPTEMBER 1990

C·O·N·T·E·N·T·S



It should come as no surprise that media giant Walt Disney tapped the Amiga as **the** *machine for its much-anticipated Animation Studio.* (Disney animators have been using Amigas for years.) Check out our exclusive coverage of this exciting program, plus our other animation features, in this special look at Amiga animation—the No. 1 game in town!*

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** The characters on the cover and in the article "Walt Disney Meets the Amiga" are copyright © The Walt Disney Co. and are used with its permission.*

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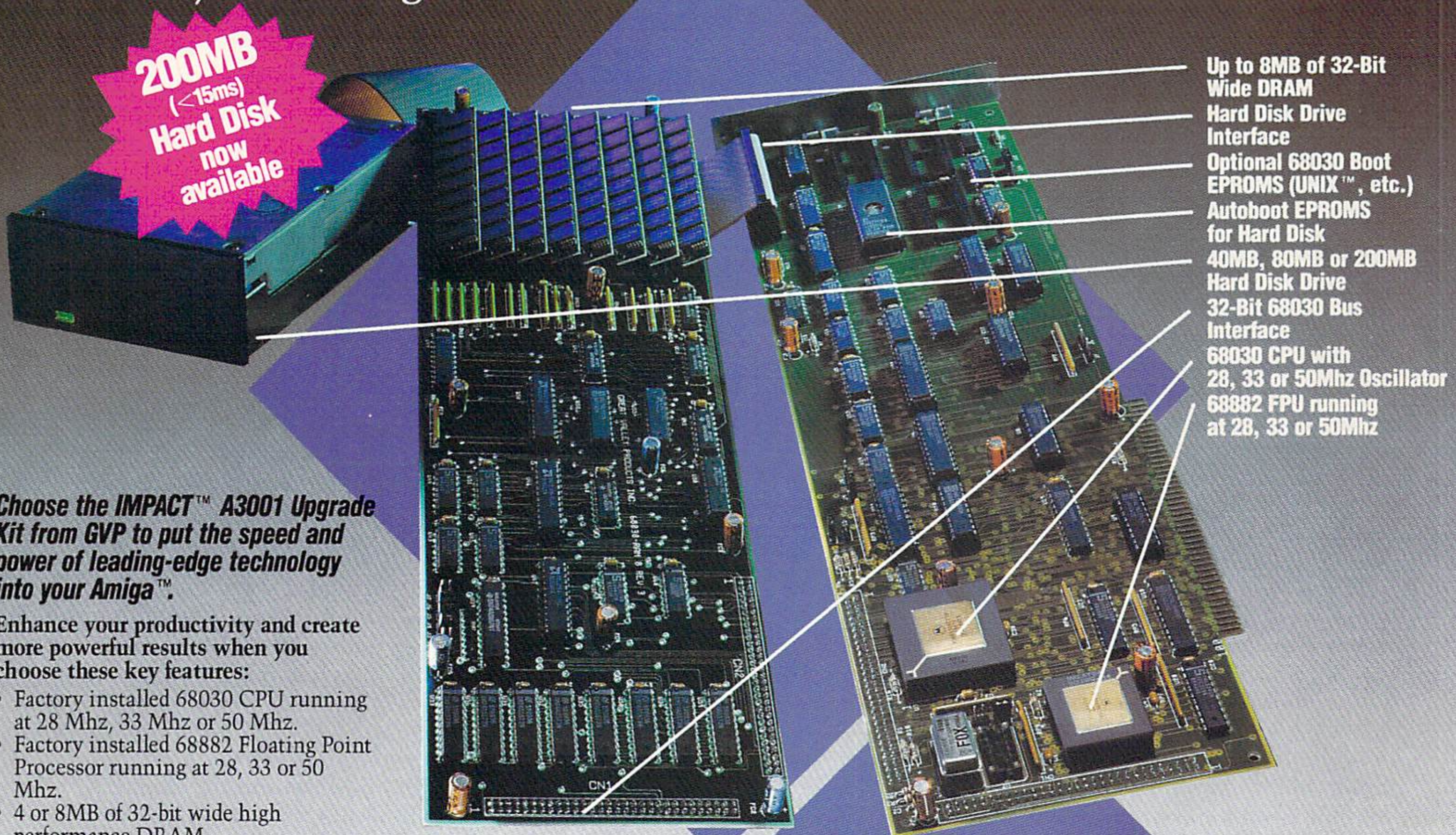
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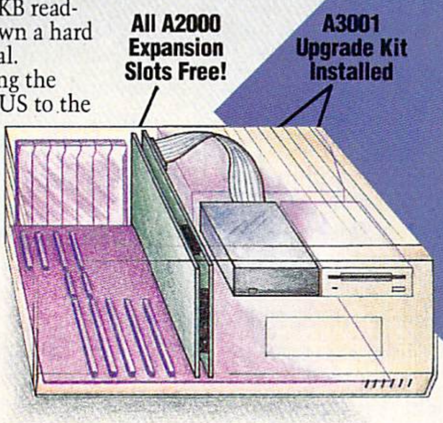
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Hard Disk Controller on 68030 Processor Board.	Y	N	Y
Number of *Open* Amiga expansion slots with hard disk drive and 8MB *Fast* memory installed.	5	3	4
Allows user to start with low-cost A2000 Amiga system and grow all the way to 50Mhz 68030 performance without sacrificing anything.	Y	N	N
Brand name vendor with solid reputation.	Y	Y	Y
Fully implements 68030 Burst Mode up to 33Mhz.	Y	N	N

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CHIEF CONCERNS

Commodore has changed. The market has changed. And the Amiga has changed.

What a difference a year makes! When I joined *AmigaWorld* 12 months ago, I rediscovered a great machine—and jumped into a floundering market. Commodore's technology was still largely superior, but was on the verge of staleness. With Apple, IBM, and other overpriced computer makers on the move, the situation seemed a bit desperate.

My, how things have changed. Commodore has changed. The market has changed. And the Amiga has changed.

Those who have followed the tribulations of Commodore's upper management probably gave Harry Copperman no more than six months in the hot seat before someone pulled the plug. But this Commodore prez has made wholesale changes to the Commodore executive team and the company's attitude. Even were Copperman to depart, his team and vision would still be very much in place. Based on what he has done so far, I'd say his job is plenty secure.

But let's face it. The Amiga still has not set the world on fire. In fact, the overall market is still dangerously lethargic. What has changed is that for the first time since its launch, the machine is positioned for real growth. And for the very first time ever, the market is ready for a machine like the Amiga. Here's why.

Without losing sight of the crazy, energetic user base that made the Amiga successful, Commodore is lunging at the fertile corporate market. It is doing this primarily in two ways. For one, the Amiga with Unix is a workstation. It is just less costly than most. For another, the Amiga is a perfect multimedia creation system with either AmigaVision or a number of authoring programs.

Now I haven't exactly done empirical research, but I know a lot of you still think that Commodore is staffed with a bunch of lame-brained, lazy, good-for-nothing, unsavory and undistinguished employees. And the reason for this opinion is that they have yet to solve your specific problem. You didn't get your call answered. You didn't see the TV ads. Your system crashed.

Believe me, I feel for you. But you are missing the point. These guys inherited a list of problems a mile long. They can only address a quarter-mile at a time, and have only solved a hundred yards' worth. For those with problems still existing, this is not a big deal. But for the overall market, it is very big indeed.

The Amiga has also made several technologic leaps in the last few months. CDTV, the A3000, AmigaVision, and the the Video Toaster (probably shipping as I write) all tilt the playing field in our favor. Each of these products can create new markets and new applications.

The biggest difference is that the market has changed. People never cared before about the wild stuff that we do on Amigas. But with the big boys putting millions into their latest buzzword, multimedia, we're getting great free P.R.

So why let up now? The amazing thing about this market is that we have the power to make changes. That is because people are now interested in what we do. The Editor in Chief of *Computerworld* recently told me (complained, actually) that he was getting five letters a day from Amiga users. "Could you please stop it?" he politely asked. Hey. It's not up to me. If Amiga owners want to seek coverage from the major publications, I can't stop them. I hope those who publish other Amiga magazines will also enlist their readers in this battle.

If this whole thing were hopeless, I'd stop beating this tired old drum. But we are making headway. Your letters are helping get the Amiga noticed. *Byte* magazine ran a cover story on the Amiga because users bombarded them with letters and phone calls seeking Amiga coverage.

Businessweek had a glowingly positive story about the A3000. Why? Maybe because you let them know they blew it when they gave the Amiga short shrift in a multimedia piece.

Everyone else is coming around, albeit a bit more slowly. Well, maybe we should pick up the pace. If Harry Copperman can have a five-point plan, so can we. Here's what you can do:

1. Write and call key publications.
2. Write and call Mike Halvorson at the ADA (612-566-0221). Tell him specifically what *you* can do, and do it.
3. Show someone the Amiga.
4. Go to local non-Amiga computer dealers and ask to see an Amiga. Tell them you heard it was a great machine.
5. Do all of the above—repeatedly.

On a more somber note: Esteemed Amiga author, programmer, and all-around terrific guy Robert A. (Rob) Peck recently passed away. Those who knew Rob would describe him as a genuinely nice and brilliant individual. Rob's Amiga experience goes back to the original Los Gatos development team. His author's credits include our own *Amiga Companion* and the *Programmer's Guide to the Amiga* that's published by Sybex, as well as the *Amiga ROM Kernel Manual*. He also wrote a handbook, numerous articles, and a monthly column for *Amiga Resource* magazine. To his wife, Andrea, we extend our warmest sympathy. ■

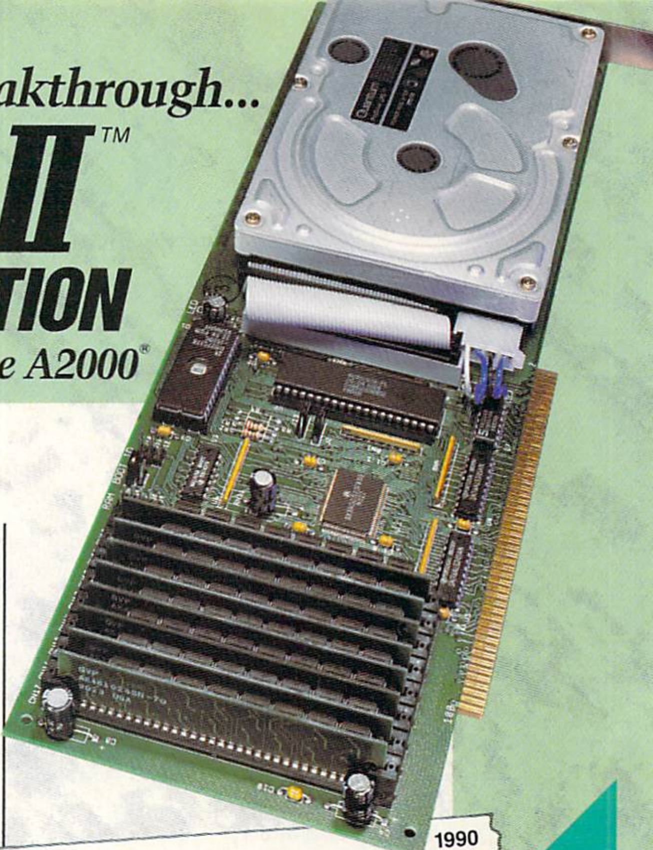


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  - ✓ Fully implements Commodore's Rigid Disk Block (RDB) standard as well as the new DIRECT SCSI interface standard.
  - ✓ Removable media drive support. Automatically senses cartridge changes and informs AmigaDOS, ensuring safe and reliable use of removable media SCSI drives.
  - ✓ Allows Direct AUTOBOOT from Fast File System Partition.
- **New INTUITION COMPATIBLE SCSI installation** and "tuning" utility included. Major features include:
  - ✓ ICON and gadget based INTUITION interface.
  - ✓ Bad Block Remapping of hard drives.
  - ✓ Auto or manual hard drive partitioning and AmigaDOS formatting.
  - ✓ Read and modify existing RDB parameters on hard disk.
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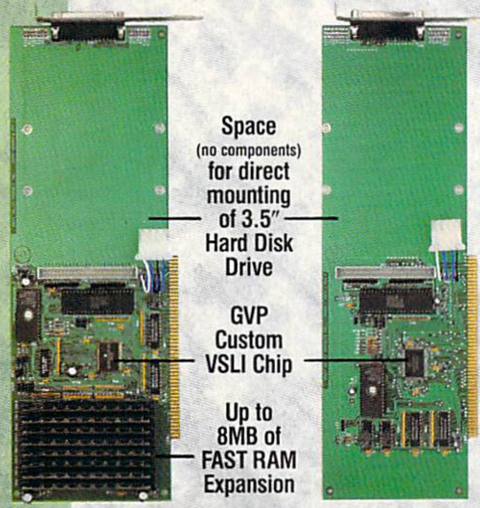
The Series II A2000 SCSI "Hard-Disk-Card"

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SCSI TIMES 1990

The ULTIMATE Trade-Up Offer???

GVP today introduced its new Series II product line and announced a bold new trade-up program, which is certain to further bolster GVP's dominant market share in the Amiga hard drive market.

Details of GVP's new TRADE-UP program are as follows:

- For $109 plus $6 for shipping (USA only), end-users can trade-up to the new GVP Series II SCSI "Hard-Disk-Card" (without drive) by simply sending in their present SCSI controller (from ANY manufacturer) together with a money order or certified check, payable directly to GVP.
- All trade-in controllers must be sent to GVP FREIGHT PREPAID.
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- For an additional $39, existing controllers can be traded-up to the new Series II "Hard-Disk + RAM-Card," which includes the 8MB FAST RAM expansion capability, populated with ZERO RAM.

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REPARTEE

Comments, complaints, and concerns

from AmigaWorld *readers.*

BRAVO FOR BABY

Your special report on the Commodore "Baby" (CDTV) came to me as a breath of fresh air (see "Million Dollar Baby," July, '90, p. 19). I grew up with Commodore and have owned nothing else, but had started to fear that Commodore was being left behind regarding CD-ROM technology.

John McElroy
Haines City, FL

The new CD-ROM-based Amiga makes this great computer the multi/hypermedia platform of choice for those of us refusing to spend the thousands that big red and big blue want to make us pay. The A3500 [*the release of which is still speculative—ed.*], coupled with a 20+ MIPS 68040, will make a network server with staggering potential.

I have just seen, however, an impressive commercial for what appeared to be a powerful multimedia platform. It puts the Amiga ads to shame, with stunning graphics that are almost indistinguishable from television pictures. The platform being promoted is a PS/2 with Intel's VDI board, which retails for $20,000 and up (although the commercial does not state the price). If I did not know that the PS/2 line is mostly hot air as to multimedia (most people probably do not realize this), this ad would have convinced me, and I'd have gone with IBM.

Even with a great arsenal of hardware and software, we are naive to think that the Amiga can succeed without similar promotion. Come on Commodore, let's hit the big guys where it counts, with attention-getting ads placed in the *right* channels.

Noam Ben-Ami
Skokie, IL

SOFT WHERE?

I was drawn to the Amiga for its potential. After five years, however, this potential has not materialized. Yes, the graphics, sound, and video applications are good, but where are the mainstream applications like dBASE, Lotus, WordPerfect 5.0, and Aldus?

I have waited a long time to upgrade my A1000, and am impressed by the A3000. After much debate and sleeplessness, however, I decided to buy an IBM 386 25-MHz compatible because its software is more reliable, functional, and feature-laden than the Amiga's. It is not the fault of Commodore that I am retreating to IBM, but of developers who release programs that are buggy or fall short in terms of features or value.

Barry Kucher
Briarwood, NY

ON-LINE TURN OFFS

Shame on General Electric for placing a picture of an Apple in the company's ad for the on-line service, GEnie! Diehard Amiga fans are really turned off by this!

David B. Conrow
Franklin, IN

It's about time Amiga users have the same benefits provided to MS-DOS and Mac users. I am talking about the on-line service of Prodigy. I urge readers to write Prodigy (2465 Black Rock Tpke., Fairfield, CT 06430) or call (800/776-3449) and request the service. The only way the Amiga will become accepted is if users let manufacturers know we want their products. Companies cannot ignore thousands of potential users.

Lewis Kemper
Alameda, CA

COVER 'TOONS

In your June '90 issue (p. 8), Helen Bambic-Workman complains about sexism on the cover of the 1990 Video and Animation Special Issue. I agree to an extent on that point, but her bashing of the "comic book" cover seems more a dislike for cartoons than anything else. Magazine covers are designed to attract attention, and cartoons, with their bright colors and ability to communicate quickly and clearly, do the job beautifully. As much as some computer people hate to admit it, cartoons are a hallmark of animation. Overall, I support the cover and hope to see more like it, preferably done with Amiga graphics.

Eric Schwartz
Kettering, OH

THINK INK

The issue of slide imaging using the Pantone Matching System baffles many (see "On Targa," July, '90, p. 95). The sole purpose of the PMS is to enable printing pressmen to duplicate the colors specified by graphic designers. Thus, PMS colors have significance only for those who intend to print their projects in ink at a commercial print shop.

Print professionals are increasingly confronted with amateurish attempts to create color originals for reproduction. Artwork from thermal printers that must be converted to the primary printing colors, or 23-color PMS PostScript files that require extensive alteration to be run by the printer, are denigrating a beneficial technology. Do not be duped. Any software that enables you to create "custom" colors by blending pigment primaries supports PMS. You need only a PMS reference guide to accomplish this.

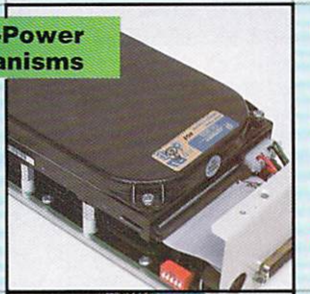
R.W. Chester
Winnipeg, Man., Canada

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INTRODUCING THE EXCITING NEW

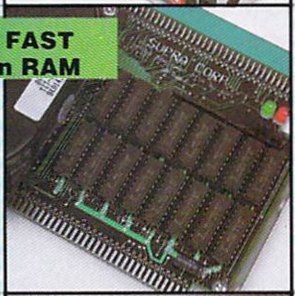
SupraDrive 500XP





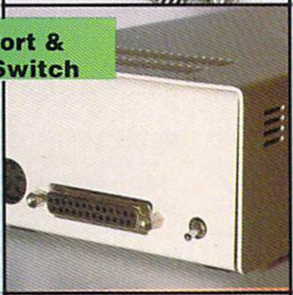
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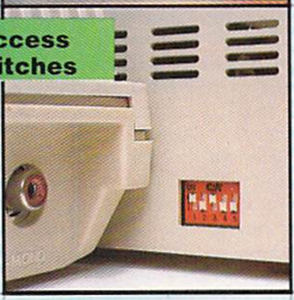
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Headliners

NEWS FROM THE AMIGA COMMUNITY

Top 3

1. Digi-Paint 3 *(NewTek)*
2. DeluxePaint III *(Electronic Arts)*
3. DVideo III/DPhotoLab *(Electronic Arts)*

Top-selling productivity software, 2nd quarter, '90. Stats: **Go Amigo! Inc.**

"Baby" Delivered: CES Plays up Amiga

CHICAGO, IL—Amiga entertainment news pervaded this year's summer Consumer Electronics Show (June 2–5). CBM stock rose, as did a flurry of excitement on the show floor, in response to the introduction of the new CD-based Amiga: code name "Baby." (See "Million Dollar Baby," July '90, p. 18 for our special report on Commodore's new technology.) Dubbed **CDTV**, Commodore's multimedia prodigy drew oohs from attendees and groans from would-be competitors.

And that's not all. The Amiga is now clearly the second most popular platform for computer games; only the MS-DOS format prevails, and then only marginally. In fact, many companies admitted to using Amigas for game development and then porting to MS-DOS. This trend makes for a myriad of new Amiga games, with **PowerMonger** (from Electronic Arts and Bullfrog, developers of Populous) among the most impressive. PowerMonger lets you play deity, but offers more features and extensive control over the world's inhabitants.

From Virgin Mastertronics comes a new title that adventure gamers are sure to love. **Wonderland** puts you in the role of Alice as you explore that twisted world, solving puzzles and overcoming challenges. Excellent graphics and animation, multiple windows, and extensive maps promise to make this a great game. A graphic role-playing adventure called **Lord Of The Rings, Vol. I** (Interplay) is based on the Tolkien trilogy. It challenges you to guide Frodo, Sam, your choice of companions, and the One Ring through a series of mini adventures and explorations in Middle Earth.

—Lou Wallace

Major Players X Comdex

ATLANTA, GA—Spring Comdex '90 rolled into steaming Atlanta June 3–6, but came up a few bricks short of a full load. Notable absentees included Apple, IBM, Lotus, Microsoft, and, most importantly, Commodore. The folks from West Chester were sorely missed by legions of fans hoping to get a glimpse of CDTV, which had its debut the same weekend in Chicago.

There was, however, a sprinkling of Amigas on the show floor, including an A3000 in the Texas Instruments booth, running the unreleased University of Lowell graphics card. The demo included Unix-interface X Windows running over a photo-realistic image. TI sources tell of a fall '90 shipping date for this long-awaited high-res device.

—Doug Barney

Amigas in the Alps

BASEL, SWITZ.—Schweizer Mūstermesse Convention Center was packed with exhibitors and attendees eager to see the new A3000 at the Amiga '90 show. The May event featured a special A3000-launch animation, and highlights from the floor included Intelligent Memory's Color Box video chroma keyer for PAL systems. (An NTSC version is now being readied for the US.) Adept of France demonstrated Painter 3D, a 3-D animation program with an elegant interface, friendly object creation, and a motion-scripting module. NTSC versions are also coming. Meanwhile, the West German company Gigatron showed off a slew of accelerator and memory-expansion hardware, including a 68020 internal 20-meg hard drive for the A500.

—Joel Tessler

DevCon Goings-On

ATLANTA, GA—This year's Amiga Developer's Conference (June 27–30) took place just as the A3000 began appearing on dealers' shelves. Appropriately, many of the technical seminars covered the A3000 and Zorro III bus. CBM engineers demonstrated a prototype 32MB A3000 RAM card, but stated that it is not an official product. (Such prototypes, however, often end up as retail units.) Some third-party hardware companies hinted that they will also have high-capacity RAM cards for the A3000; other rumored A3000 products include 68040 accelerators and custom video cards.

At the well-attended Workbench 2.0 seminars, programmers seemed intent on making their applications not only work under the new operating system, but also take advantage of its features.

Other topics included networking and the AmigaVision authoring system. CBM enticed developers toward multimedia (a major topic in seminars on both AmigaVision and CDTV) and held closed-door meetings with certain companies on the subject.

—Lou Wallace

Amigas Have Class

LOS ALTOS, CA—"Use cel animation to create a TV advertisement for a pizza-flavored toothpaste." That was just one assignment in a summer program Foothill College runs to introduce gifted teenagers to small-scale video production—using 15 A2000s. The class is designed and taught by John Thomas Berry, author of "Inside the Amiga With C" (Howard W. Sams, '88).

Nancy Berry, John's wife, directed the summer '89 youth programs at Foothill, and, with instructor Juanita Croft, taught computing skills on the Amiga to kids from two job-training programs. Nancy found that challenging the students with graphics programs gave them a painless route to success and escalated self-esteem. She discovered classes growing as the term progressed, when passers-by became intrigued by the Amiga. Juanita used Plan/IT, WordPerfect, and Pen Pal to hone the vital reading, writing, and math skills of the students.

During the academic year, the Amigas play a part in desktop-video, publishing, graphics, and C-language courses for adults.

—Sue Albert

AmiExpo takes "Hard" Hit

CHICAGO, IL—Hardware was the theme of this summer's AmiExpo (June 29–July 1). Chicago welcomed West Germany's Kupke Computertechnik with its **Golem Streamer** (60–150MB), the **Golem SCSI II** 16-bit SCSI controller, and a hi-res video camera with RGB splitter and stand.

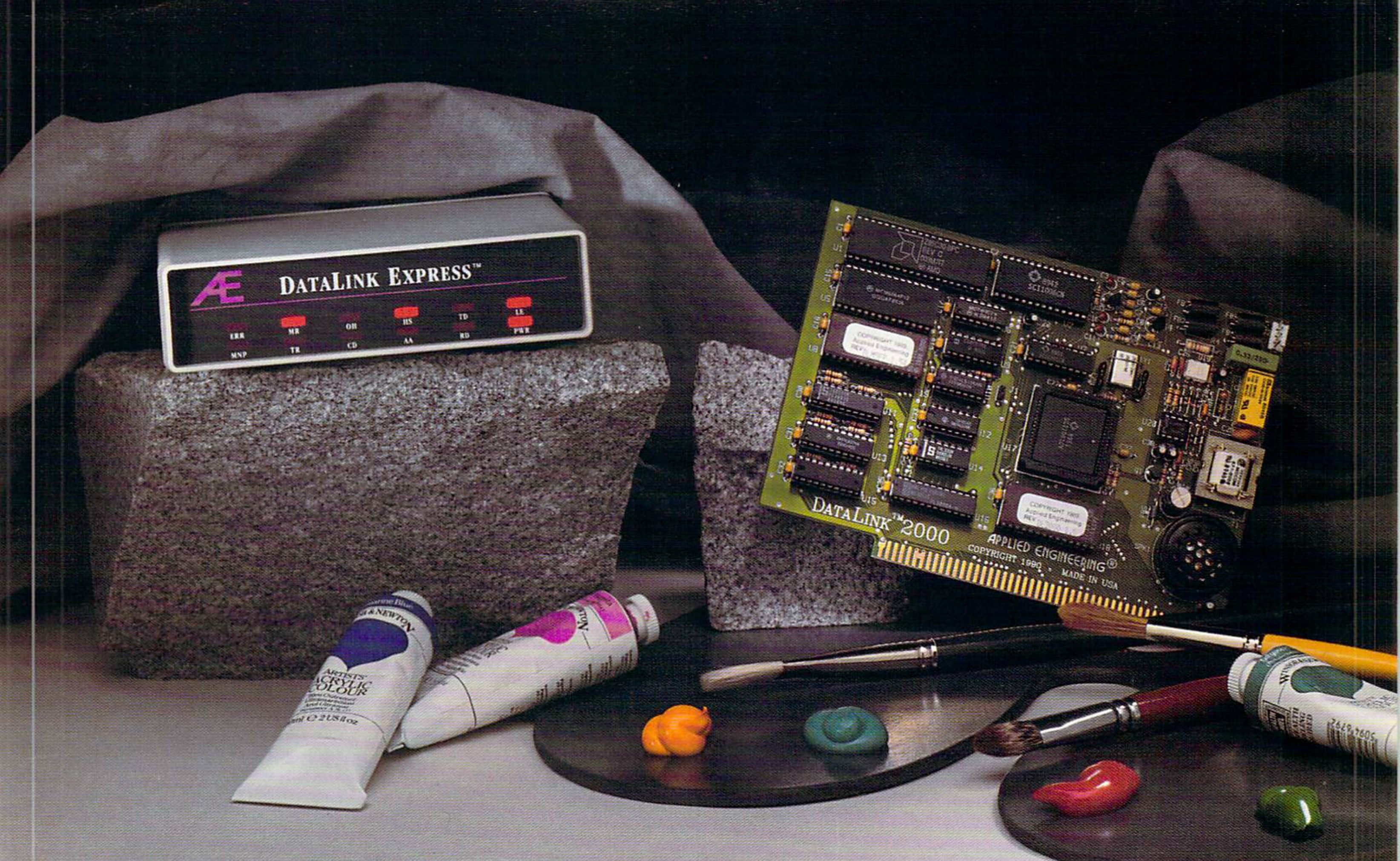
NewTek occupied two huge booths, while Pulsar challenged attendees to run IBM software on an A500 equipped with its **Power PC** bridgeboard. Also in the Pulsar booth was CSA's **Mega Midget Racer** 68030 accelerator for the A500, A1000, and A2000. Black Belt Systems demonstrated **HAM-E**, while Spirit announced an inexpensive **genlock/encoder**.

Supra pointed to a glass-encased **25MHz 68040** for the A3000. In the Digital Creations booth, a looping display of **DCTV**-created animations ran from an Interactive Video Systems hard drive at 25-30 frames per second. Across the way, ICD challenged with a similar display.

Networking systems popped up both on the show floor (at the DigiFex booth) and off (in Progressive's suite).

On the softer side, Lake Forest Logic showed **Macropaint**, a Dynamic HiRes paint program, and announced that it is working with Pixar, the high-end graphics company, to bring the **RenderMan** solid modeler to the Amiga.

—Barbara Gefvert Tyson



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Pro/Motion

Escape from animation drudgery

By Harv Laser

PUT ON YOUR helmet, grab your flashlight, and get ready to climb into the darkest recesses of your software library—way back to that dust-filled corner where you put your copy of VideoScape 3D (Aegis/Oxxi), after deciding it was just too difficult to use. While some talented pros were not intimidated by having to figure out on graph paper how to fly a spaceship past a building in VideoScape, the rest of us wondered why the program could not make our powerful computers calculate object- and camera-motion paths. For us, salvation has finally arrived. Its name is Pro/Motion.

Pro/Motion is not an object editor, format converter, rendering program, or player. Its sole purpose is to give VideoScape 3D owners a powerful and extremely intuitive means to build simple or elaborate motion-settings files. To say that the program accomplishes its mission well is an understatement. Pro/Motion takes *all* the drudgery out of creating motion files for VideoScape 3D. Its many helpful and original features will surprise and delight you.

We Like Those Wide Open Spaces

Pro/Motion is a big program, with over 600K of code plus a couple of subdirectories of ancillary files, overlays, and libraries. An installation script copies the whole thing from the original disk, and although the manual does not list a hard drive as a requirement, I would not recommend using Pro/Motion without one.

Pro/Motion also needs a lot of RAM. Because it operates only on an eight-color hi-res screen and can open multiple windows and informational displays, a few megs of RAM and a Super Agnus chip are a plus. Using Pro/Motion's Sleep mode, you can multitask it with VideoScape 3D and 2.5 megs.

What you see when you fire up Pro/Motion is similar to the view you'd get of a movie studio's soundstage from a catwalk high above. (Film-studio jargon is used throughout the program, so it helps to think like a director.) At first, you see just a grid-covered floor and a camera. You take off via menus for the props department (Pro/Motion refers to VideoScape 3D object-geometry files as props), choose the things you'll need for your animation, and place them on the stage. To speed things up, your props are represented by simple round "bobs." Bobs come in a dozen sizes, from a pinpoint to about half an inch, to simulate the relative sizes of your objects. A memo option lets you label these so you won't forget which is which. The camera is represented by a small, red object in the shape of a movie camera.

Pro/Motion lets you place up to four light sources (the maximum number VideoScape can handle) anywhere in your scene at any height. Light props look different from object props, so there's no confusion.

Around the Block

Once your props and lights are on the stage and you have determined how many frames of animation you want, you can "block" paths for the props and the camera by drawing with your mouse. Paths are not limited to ground level; by invoking the Height window you can change altitude. You can also bank, pitch, and rotate the camera or props in any combination of directions, and as you do so, Pro/Motion shows you exactly what is going on at each step, thereby allowing you to alter your course either as you go or after you finish.

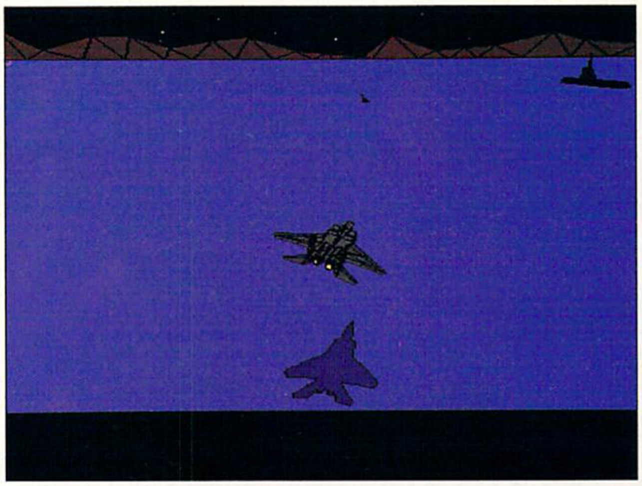
During or after blocking, you can stop for an Action display. This prompts Pro/Motion to quickly make hundreds of very precise calculations, and then animate your object and camera bobs along their paths to give you a feel for the overall flow. You can even open some windows to get an edge-on view of changing prop heights. Press a key during replay to save Snapshot files, and then put Pro/Motion to sleep, flip to VideoScape's control window, load the snapshots, and render your scenes in 3-D (wireframe or shaded) to check object placement and movement, camera position, lens angles, lighting, and so on. When you are happy with everything, save a settings file, load it, and render your animation while still in VideoScape.

Pro/Motion recognizes VideoScape's 99-keyframe limit and automatically saves settings files for long animations in sequentially numbered, 99-frame "reels." When one finishes rendering, just load in the next and carry on.

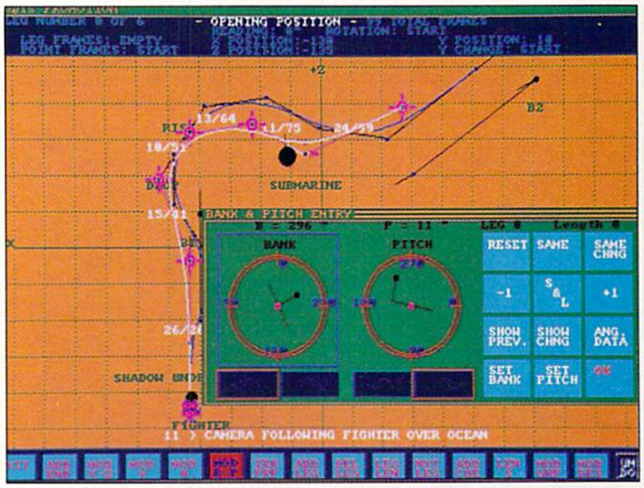
If you want to get really fancy, try Pro/Motion's special-effects department. Turn on the wind machine, from a gentle breeze to a hurricane, play around with gravity, or magnetize your props to attract or repel each other.

It's Smart!

Most programs that provide keyboard substitutes for menu items demand that you remember some arcane and proprietary sequence of Amiga, Alt, Ctrl, or Shift keys plus a number or letter. Pro/Motion lets you use whichever key is most comfortable for you: Pressing AMIGA-S, ALT-S, CTRL-S, SHIFT-S or just S brings up the Save requester.



How to pilot a fighter.



Plot its path from above the scene's "stage."

Every important and oft-used menu command has a key equivalent, and the mnemonics are logical and easy to remember. A keystroke buffer lets you queue up actions as fast as you can type the single-letter commands.

Building on VideoScape's conventions, Pro/Motion provides very intelligent file-saving and -naming routines. You don't have to remember if a filename should end with .MOT, .PMOT, .CAM, .SET or .PSET. To save a VideoScape Camera file, just type a name into the requester; Pro/Motion adds the .CAM extension automatically. Pro/Motion supports every file type that VideoScape 3D can load, plus all of the parameters those files can contain, and it builds and saves them quickly and correctly.

A wonderful feature known as Phoenix anticipates a system crash (no matter which task causes it) and backs up current settings, making it simple to recover *all* your work. I wonder why more Amiga software doesn't work this intelligently.

What's missing in Pro/Motion? Not much. Despite the complexity of this software, the manual is fairly extensive and easy to understand, although one of the tutorials stopped abruptly midway through. Also, some tutorial disk files are in directories different from what the manual states. A videotaped tutorial would be a plus.

Pro/Motion could stand to have a few more features, such as a control for prop acceleration. And how about the ability to save motion paths for use in programs such as Turbo Silver (Impulse) and Sculpt-Animate 4D (Byte by Byte)?

Other than these nitpicks, I give Pro/Motion a very high rating for its intelligence and power. If you're a VideoScape 3D owner who was never comfortable with the idea of using graph paper and text editors to create object-motion paths, Pro/Motion offers the complete solution to solid-model animation bliss.

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SEVEN PROGRAMS FOR SMALL FRY

Not a Toto loss

By Randall R. Greenwald

SOMEWHERE OVER THE rainbow, skies are blue, and educational software developers have wed the powerful potential of programmed learning and multimedia with the needs of the child, to produce stimulating, challenging, and fun packages. On this side of the rainbow, unfortunately, most software designed for children does not fare so well. ABZoo (MichTron), Barney Bear Goes to School (Free Spirit), One to One Match (Computer Sight), PETE (Superior Software), World Odyssey and Math Odyssey (Polyglot/The Other Guys), and The Talking Animator 2.0 (JMH Software) all represent diverse approaches.

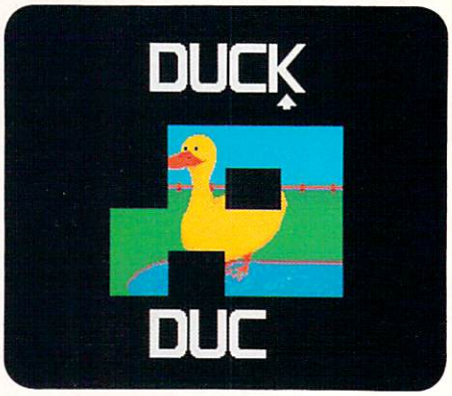
LIONS AND TIGERS AND...

Imagine you are wading on some tropical shore, when suddenly, you see a xypho scurry into the water! How did you know it was a xypho? Why, when you were a child, you owned **ABZoo!**

Animals, common and exotic, are the key used by ABZoo in its quest to teach the alphabet. The program guides children through three levels, at the most basic of which they are encouraged to ►

choose letters randomly from the keyboard. As a reward, a picture of an animal corresponding to the letter chosen appears on screen. The second level presents an animal and requires the child to type from the keyboard the animal's name as displayed on the screen. The third level is the same as the second, but the child must type the name from memory. In levels two and three, a picture of the animal materializes as the child types.

There is one animal for every letter of the alphabet, which produces some interesting results (common animals like Cow for C, and strange animals like Narwhal for N and Ursus for U). MichTron has done a good job with graphics, and the screen fades are a nice touch, but, as so often occurs, the program is only slightly more appealing than reading-book worksheets. Children play it a few times to see the pictures, but no creative attractiveness begs them to return for more. It does not add any elements of fun, thinking, or challenge to the learning process. Beware the Jabberwock, as well as software that promotes itself with promises that "Your child will be far ahead of classmates in both reading skills and computer literacy."

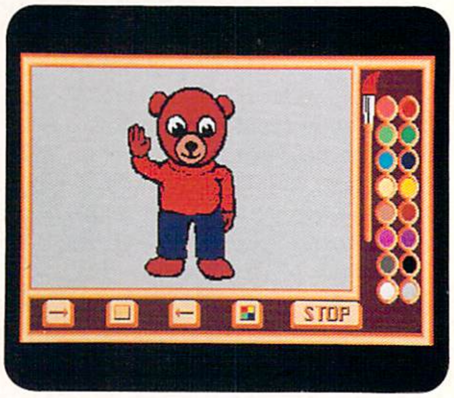


Level 2 of ABZoo.

. . . Bears, Oh My!

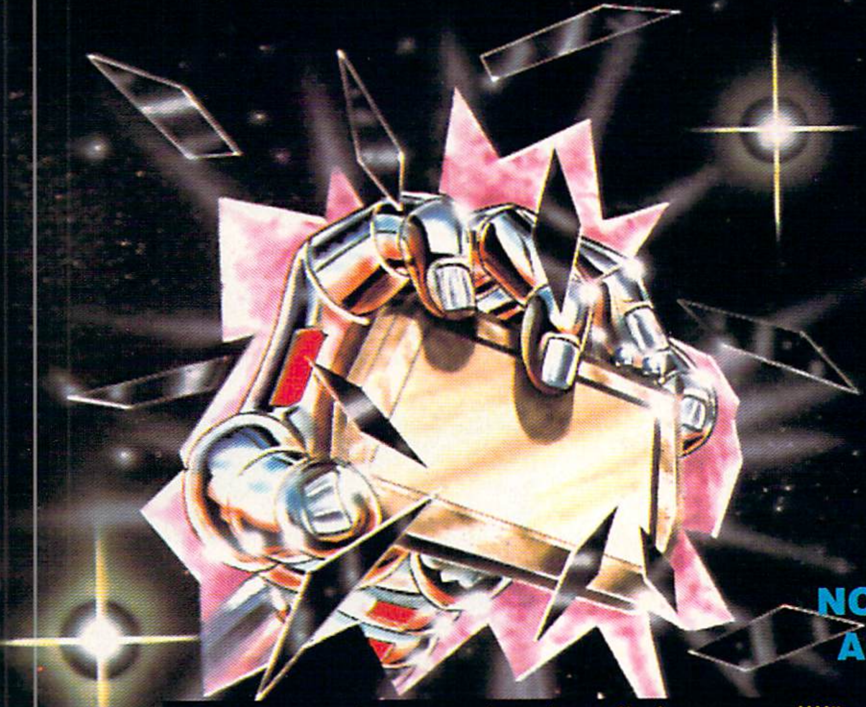
Barney Bear Goes to School is geared for very young kids. The short interactive story that begins the program follows Barney from the ringing of his alarm clock to his arrival at school. (I wonder, though, what modern child can identify with Barney's one-room schoolhouse.) Once at school, the child can choose to explore several areas of interest—including the alphabet, spelling, numbers, counting, and coloring—by clicking on portions of the screen.

The alphabet, spelling, numbers, and counting modules are all notable for their predictability and lack of creativity. The child is introduced to letters and numbers (by the Amiga's voice), and ►



Barney does best when coloring.

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asked to pick the letters from the keyboard corresponding to a word appearing on the screen, or to click on the number a picture represents. It's all very simple and dull. The coloring-book portion does merit some praise, however. The child can "color" a number of black-and-white line drawings using the mouse and a 16-color palette. My six-year-old enjoys this, which suggests that there might be a market for a disk of IFF files that a child could color and manipulate using a paint program.

Barney runs in either English- or German-language formats. In the German version, the child can click on "Ja" and "Nein" instead of "Yes" and "No," but all other text is in English. For example, "dog" and "cat" are written on the chalkboard of Barney's German schoolhouse. How odd.

Overall, the program is uninspiring. The graphics are only average, and the lack of animation, despite opportunities for it, is disappointing.

THAT'S THE HORSE OF A DIFFERENT COLOR!

Take a deck of cards, turn each one face down on a table, and, with a friend, take turns flipping them and making matches. As a kid we called this game Concentration. The Amiga version is called **One To One Match**, and its rules are just that simple. The child can play without competition, against another human opponent, or against three levels of computer opposition. Instead of uncovering kings and aces, however, the child matches shapes, flags of the world, numbers, dates, musical notes, stellar objects, animals real and imagined, continents, and even songs. The number of options is a plus. After our six-year-old goes to bed, my wife and I might pull the shades, pour a bowl of Frosted Flakes, and keep playing against each other.



You've got a match!

Most of the artwork is good, the user interface is well designed for even the youngest child, and no keyboard input is required. By far the best part of the program is the creative use of music. My family tends to linger over one screen while Dvorak's Humoresque plays in the background, and one of our favorite games requires you to match melodies that are hidden beneath squares (a very creative use of the computer).

You probably will not be disappointed if you purchase One to One Match for your child. Keep in mind, however, that this program, like many others, provides

Continued on p. 66

SuperGen™

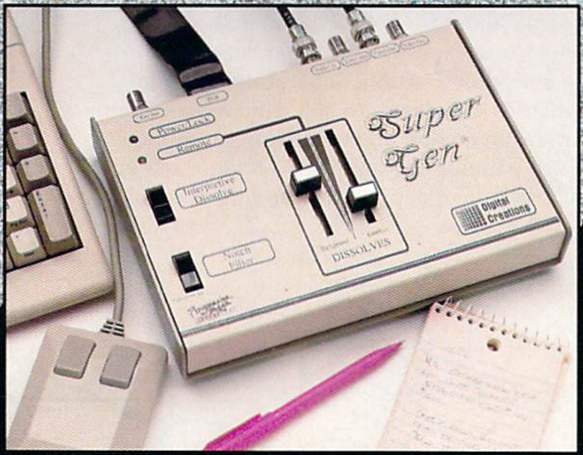
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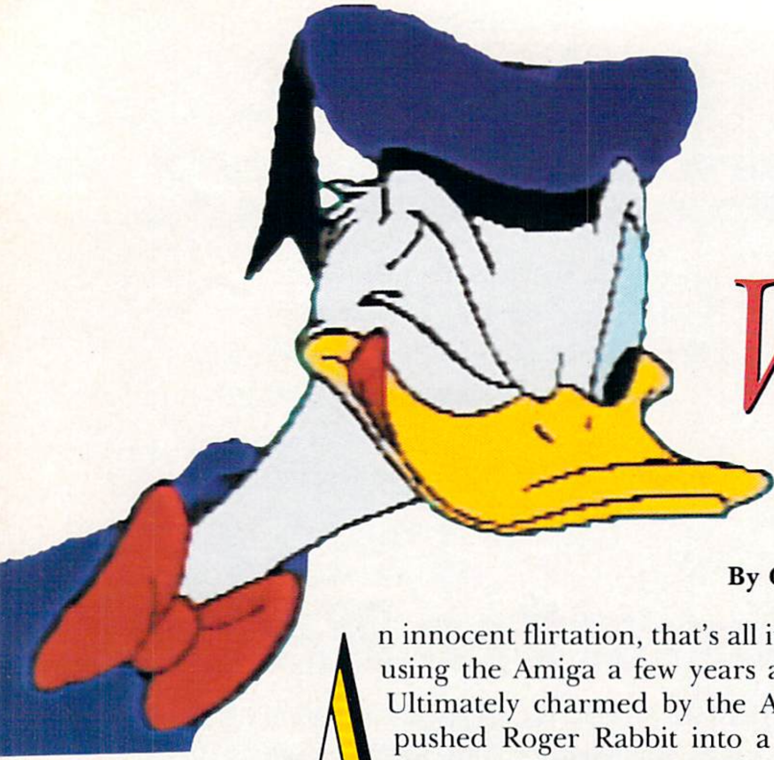


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Walt Disney...

By Gene Brawn

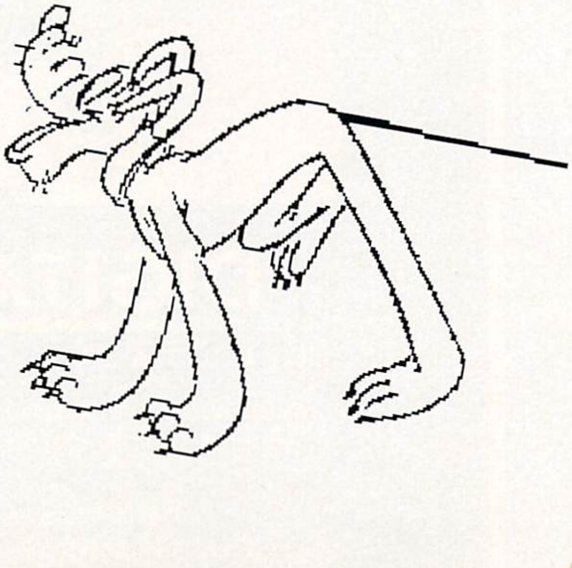
An innocent flirtation, that's all it was at the start. When Disney animators started using the Amiga a few years ago, they were "just fooling around," they said. Ultimately charmed by the Amiga's graphic sophistication, the media giant pushed Roger Rabbit into a trial engagement. The release of **Disney Presents. . .The Animation Studio** ($179, Walt Disney Computer Software) signals that, finally, this duo is headed for the altar.

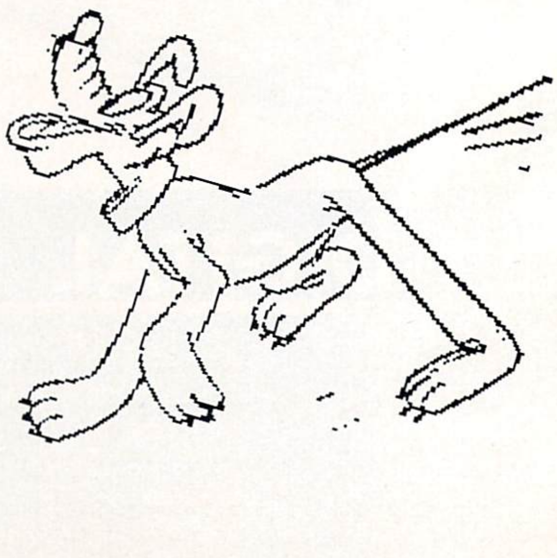
The three-disk, two-manual package is absolutely faithful to the working habits of the traditional pencil-and-paper animator. Each of The Animation Studio's three modules represents a single step in the animation process.

Pencil Test, the heart of The Animation Studio, is the electronic equivalent of the traditional animator's onion skin paper "pencil tests." Because of the translucence of onion skin, the artist can place a clean sheet of it over an already drawn frame (or cel) and reference that frame while drawing the next. As the animator continues to layer frame upon frame, the previous drawings get lighter. The same thing happens in Pencil Test: Draw a frame, advance to the next, and you will see up to three of the previous frames still on the screen. Now grayed, these images are not really part of the current display even though they remain visible. You can draw in the new cel, using the earlier images for reference, without changing them. Whether drawing on paper or the computer, Disney-style animators strive at this stage for fluidity in the character's movements. By sketching only the outlines of a figure, you can concentrate on poses and positions.

In The Animation Studio's Exposure Sheet, you set the frame order and specify audio cues for synchronizing sound and action, replicating the traditional animator's directions to the cameraman for assembling the animation and committing it to film.

Inking and painting the animator's outline cels is traditionally the final step before sending the ani-





...Meets the Amiga



. . . And it looks like The Animation Studio will make it a perfect match.

mation to the camera. In the same fashion, you use The Animation Studio's Ink & Paint module for adding the color and backgrounds to complete your animation. Then just sit back and enjoy.

None of this is particularly new. After all, The Animation Studio is patterned after a medium that matured nearly 60 years ago. Even in the nascent computer world, most of The Animation Studio's features are not unique. What makes it unique is that The Animation Studio is simple to use, is well thought out, has great documentation, and, most importantly, has Disney behind it.

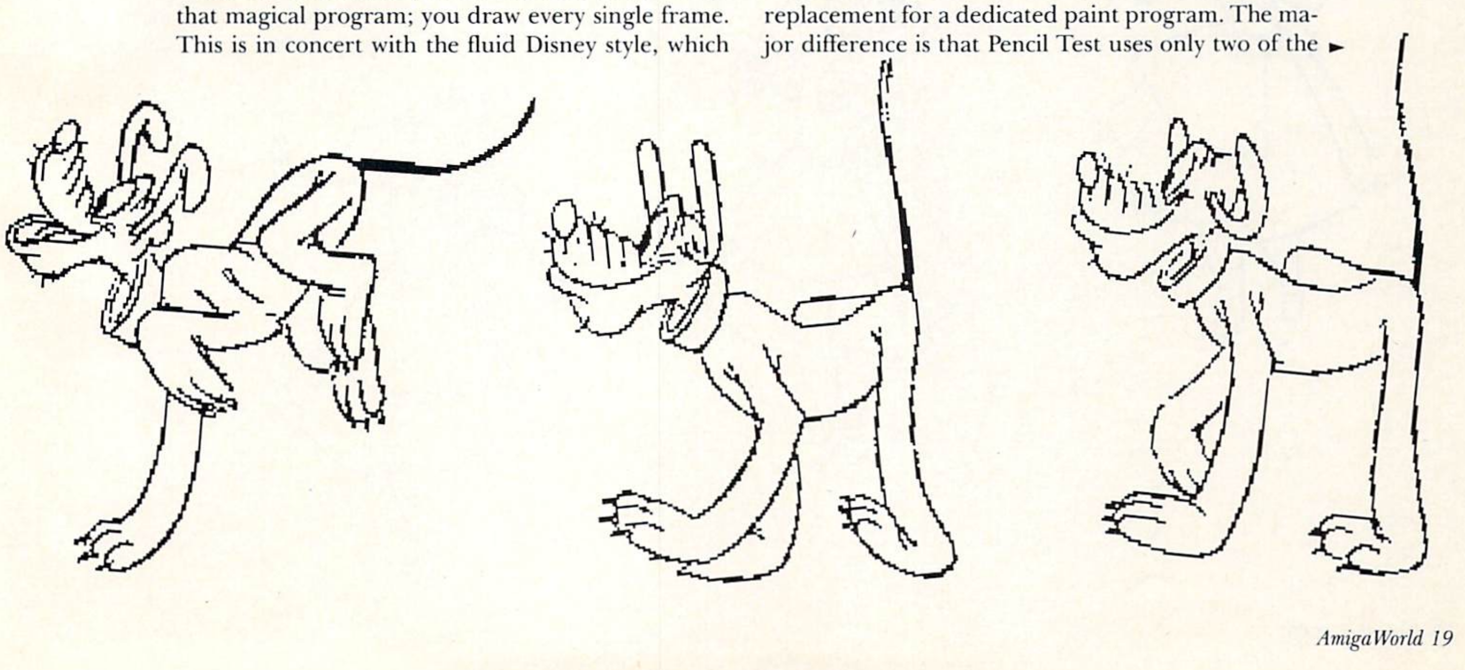
Be warned, however: Although easy to use, The Animation Studio will not draw your characters for you. In a commercial animation studio, the lead animator is responsible for the design of a character but, normally, draws only a few key frames of the figure in crucial poses. Filling the spaces between the key frames is the job of the "tweener." One of the long-standing goals of computer animation is to develop software that can replace the tweener.

Harbor no illusions, The Animation Studio is *not* that magical program; you draw every single frame. This is in concert with the fluid Disney style, which depends on the artist's intuition and skill, rather than the computer's cold calculations. Every mistake, and every success, is in your hands. If you are not an artist or are not willing to learn to draw, this software is not for you. If you are fascinated with traditional animation and are willing to invest some effort, however, you'll find no better program with which to make your dreams come true.

PENCIL TEST: NOT A CLONE... OR A PAINT PROGRAM

The first thing you see when you fire up The Animation Studio is the gorgeous title screen. After a quick trip to the disk, the Pencil Test work space appears. If the interface looks familiar, it should. Much of this module is patterned after DeluxePaint III (Electronic Arts), from the toolbox design to the keyboard commands. The advantage of this approach is that the average DPaint user will put The Animation Studio through its paces almost instantly. Pencil Test, however, is not without its distinctive quirks.

While it resembles DPaint, Pencil Test is not a replacement for a dedicated paint program. The major difference is that Pencil Test uses only two of the ►







Amiga's 4096 colors for drawing. If you try to import an ANIM with a larger palette into this module, the ANIM will load, but only after the software has converted it to two colors. This precludes using The Animation Studio for rotoscoping or manipulating complex digitized images, because most of the detail is lost in the translation.

Although Pencil Test supports the most commonly used drawing tools, it lacks many others. Missing from the roster are airbrush, perspective control, anti-aliasing, polygons, built-in brushes, and a freehand fill, among others. This is as it should be. Pencil Test is designed for a single purpose—the creation of outlined, animated characters. Inclusion of these (mostly) superfluous tools would only obscure its sharp focus.

Pencil Test does include a few tools that, while not innovative, are improvements on previous attempts of other software. I particularly enjoyed the ellipse function. Instead of simply dragging the mouse to size the oval as with DPaint's tool, in Pencil Test you use an axis line to size *and* rotate the shape until it meets your requirements. The page buffer and related controls (insert, delete, and clone) make it equally easy to move frames around in your animation. These commands are available from the toolbox, but, alas, not from the keyboard.

I welcomed the on-screen icons that control animation playback and single-stepping of frames. Unfortunately, Pencil Test's keyboard equivalents are much less successful. While DPaint uses the left-hand number keys (1–6) for single-stepping and playing the animation, The Animation Studio uses the cursor keys to perform most of the same functions. This arrangement is certainly logical, but it is inconvenient for right-handed artists. You must either remove your hand from the mouse to strike the keys (a reflex move for a touch typist) or reach across the keyboard with your left hand. I prefer DPaint's method.

The Fade Colors function lets you control the number of grayed frames displayed, up to a maximum of four. This is useful, for example, if you have a series of complex, detailed cels and want to reduce the number of superimposed frames to one or two.

The Clean Up tool removes stray pixels from the screen. It does its job so well that it makes me wish another similar feature had been included: a trim function. Drawing a consistent one- or two-pixel wide line by hand is nearly impossible. Being able to specify a line width and let the computer automatically trim the offending pixels from the drawing would be a welcome addition.

Exposure Sheet: Follow the Cue Cards

If you have used a traditional exposure sheet, you will be right at home with The Animation Studio's version. Basically a preformatted script editor, Exposure Sheet allows you to add cel and frame numbers in the two left-most columns, while the rest of the page is reserved for explanatory comments and sound and music cues for the program. To speed the creation process, Exposure Sheet provides word-processor-like edit controls, such as cut, paste, and block moves. To complement these, the elapsed-time readout in the menu bar is a nice touch. As you add frames, the program automatically displays, in minutes and seconds, the current elapsed time, based on the frame rate you have selected (up to 30 frames per second).

A peek at the Preview menu shows that you can load scores and instruments. The Animation Studio actually plays SMUS files! As far as I know, this is one of only a handful of programs that do so. I hope it indicates the beginning of a trend.

Exposure Sheet defaults to animations "on twos," a technique that allows animators to save time and







effort by drawing only 12 frames for each second of screen time. Because film runs at 24 frames per second, this equates to one animation cel for every two screen frames—hence "on twos." You can adjust this to as many as one cel per six frames: "on sixes."

Ink & Paint: Fill 'Er Up

When working in Ink & Paint, I almost expect to hear my elementary school art teacher admonishing, "Remember to stay inside the lines, children!" Ink & Paint, however, is much simpler to use and more flexible than a coloring book. Most of the time, you will use its four fill tools (two dithers, Fill to Line, and Fill to Color) to add up to 32 colors (up to 4096 if dithered) to your characters. Unfortunately, The Animation Studio cannot create HAM animations. The authors have tried to remedy this limitation with a dithered fill mode. Most effective in hi-res, dithering is a technique that depends on the juxtaposition of two colors to fool the eye into perceiving a third, illusionary, hue.

The Camera menu selection almost qualifies as a separate module. It allows you to load and mix backgrounds with differing palettes (any or all frames can have their own) in a single animation. Its Frisket tool is much like DPaint's Stencil command. You use it to merge character-animation cels automatically with a background.

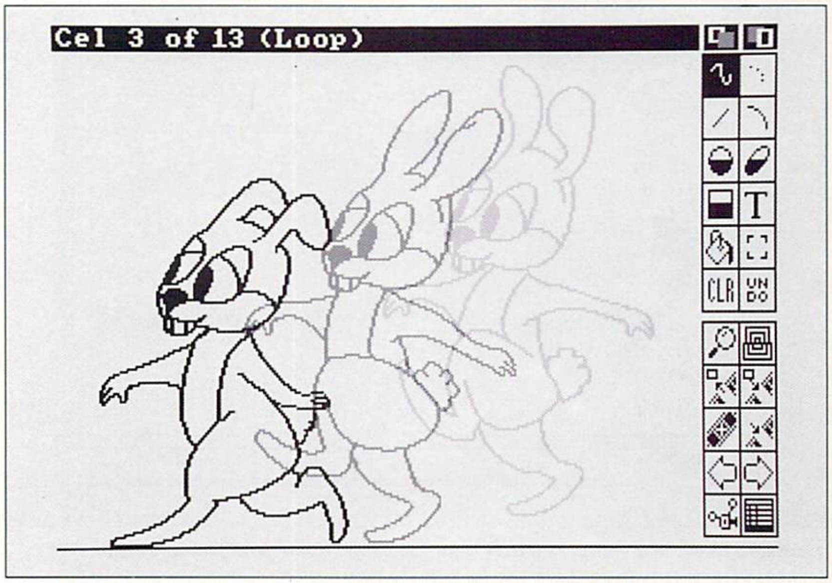
To keep the colors true when transferred to videotape, Ink & Paint offers a welcome and very unusual feature: the NTSC filter. The Animation Studio cures RGB-to-NTSC color shift (brown is red, red is smeared, and so on) by filtering the RGB colors to match the NTSC standard. All you have to do is select NTSC Filter from the Preferences menu and send your opus to video.

In addition to reading ILBM (Interleaved Bitmap) and ANIM formats, The Animation Studio reads and writes its new CFAST format, which consists of the ANIM, the color information, and the Exposure Sheet data. As a result, you can create a single animation file that includes sound effects, a music track, timing cues, and multiple palettes. A proprietary program called Flicker is provided to play these files.

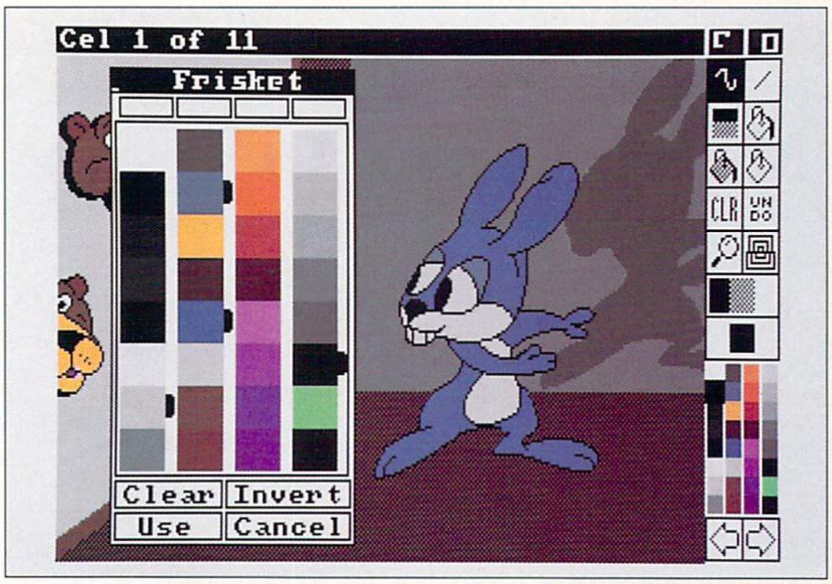
The only fatal crash I experienced was format-related, caused by trying to load an ANIMbrush as an ANIM file. Because Amiga files are so easy to identify with software, a crash like this is preventable and, therefore, unacceptable. It is also a little bewildering, because a great deal of the programmer's time was obviously devoted to making this program as foolproof as possible. This was the only bug I encountered during my odyssey.

Bucking the current trend of elephant-sized applications, The Animation Studio is extremely memory efficient. The program's modular design allows you to load only that part of the software that you intend to use. Another example of the thoroughness that permeates this program are commands that allow you to selectively unload nearly anything you have loaded, from music and instrument files to fonts. As a result, The Animation Studio can run on a 512K Amiga and still leave lots of room for animation. The Animation Studio also keeps issuing warnings as you approach your system's memory "no-man's-land." If you persist, as I did, you will eventually crash your system, but you can't say that you weren't warned!

Hard-drive installation is a snap: Simply copy the contents of the program disk to a subdirectory on ►



Pencil Test lets you see previous frames as you draw a new image.

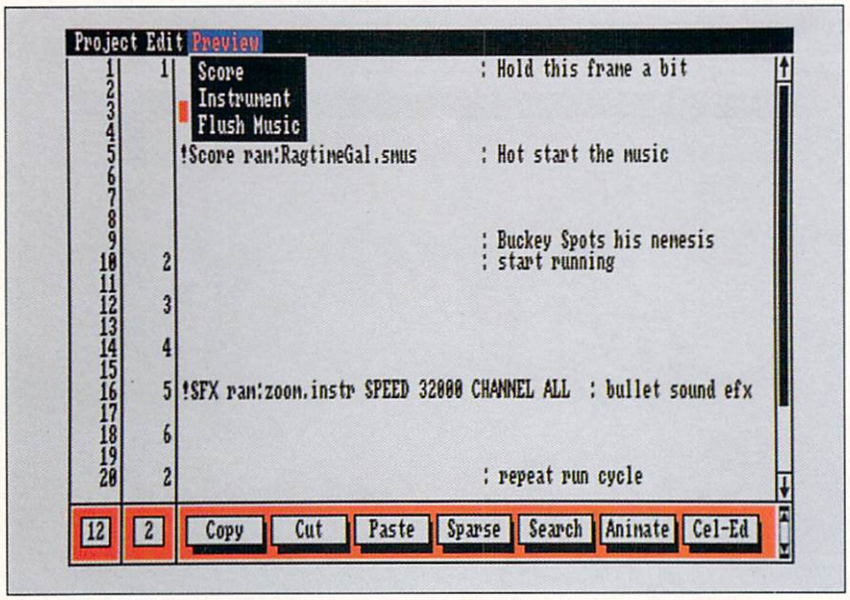


Ink & Paint's Frisket tool helps you merge your colored characters to a background with a different palette.

your drive, and you are ready to animate. Just keep the manuals handy to answer the copy-protection questions.

DOCUMENTATION: READ IT AND REJOICE

The Animation Studio's two manuals (one for novices, the other for experienced computer artists) are the finest documentation I have ever used. They are written in a clear style that fully explains the program without talking down to the user. To top off the package, they are well indexed and accompanied by a bibliography and a comprehensive, illustrated glossary. Even if you do not normally use manuals, I recommend that you read these.

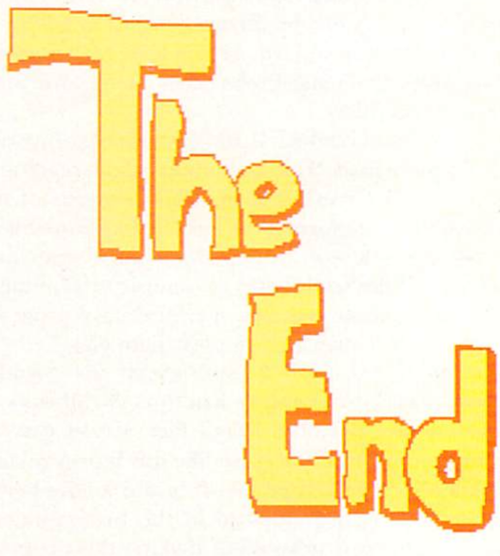


Exposure Sheet lets you orchestrate your animation's flow and sound track.

After a brief introduction to the Amiga, the novice volume dives right into several complete tutorials on animation and The Animation Studio. The advanced Users Guide, targeted at a more sophisticated audience, contains detailed descriptions of all the modules and their functions, plus a brief, but informative, history of Disney animation. Useful tips about animation are sprinkled throughout the appendices. Still want more? The documentation contains formal tutorials as well, providing tips from the animators at Disney. Several on-disk, sample animations supplement the tutorials, as do a few snippits of Disney characters in action. The Disney characters cannot be saved when modified, nor can the files be copied. (Why am I not surprised?)

When a company as prominent and well-regarded as Disney decides to back the Amiga, it marks a turning point in the perception of the machine. Disney is known throughout the world as much for its business savvy as for its entertainment products. It is definitely big news, then, when this entertainment giant decides to offer a software tool that turns your computer into a Disney-approved animation studio.

I wish more software exhibited the attention to detail that's evident in The Animation Studio. Although it may not take advantage of all the Amiga's advanced features, The Animation Studio's consistency, speed, and ease of use make it an outstanding piece of software. ■



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Walt Disney Computer Software Inc.
500 S. Buena Vista St.
Burbank, CA 91521
818/567-5360





MOTION in the Mind's Eye

Mastering the subtleties of the animation process itself is the real key to becoming a good Amiga animator—as this three-pronged tutorial will prove.

By Brian Williams

ALTHOUGH YOU MAY be able to master the documentation of Amiga animation tools—paint packages, rendering programs, animation software—you will never really move beyond the "nifty-demo" stage of animation creation unless you understand the principles and techniques of animation as a whole.

While crisp, clean checkerboards and glass spheres in precise motion may be genuinely eye-catching in a purely formalistic kind of way, computer animation in general relies much too heavily on rigid mathematics that results in artificial creations. What you get is a stereotypical kind of motion that is just too "perfect" when compared to the subtly complex, imperfect reality it is trying to represent. To help you create involving and enjoyable animations that rise above that nifty-demo genre, we'll take a close look at three very important aspects of animation: frame rate, motion blurring, and accelerated motion.

Rendering Without Surrendering: Frame Rate

All forms of animation, no matter how diverse, have one thing in common: They simulate continuous motion by quickly flipping through discrete images. If the images are flipped rapidly enough, the observer fuses them together and perceives motion in a process known as persistence of vision. If the images flip by too slowly, the viewer experiences only an annoying series of staccato movements. Although effective frame rate may vary from person to person, the minimum generally seems to be about 16 frames per second (fps). Motion-picture cameras run at 24 fps, while television clocks in at 30 fps. This means that to produce a good animated feature film, every character must be redrawn 24 times for each second of film.

Obviously, this requires an enormous amount of time, which results in overworked animators and high production costs. The situation is not much alleviated by the introduction of computer-generated films. Even using high-speed supercomputers, a single second of an animation can still take many hours to render—which translates, in studio terms, into very hefty outlays for computer-rental time. If you are thinking that using your Amiga will cut down the costs, well, yes, it will. . .but, remember, in addition to substantial rendering time and effort, you also have to worry about the tremendous memory demands even a simple animation can put on your system. ►

ILLUSTRATED BY EARL KELENY

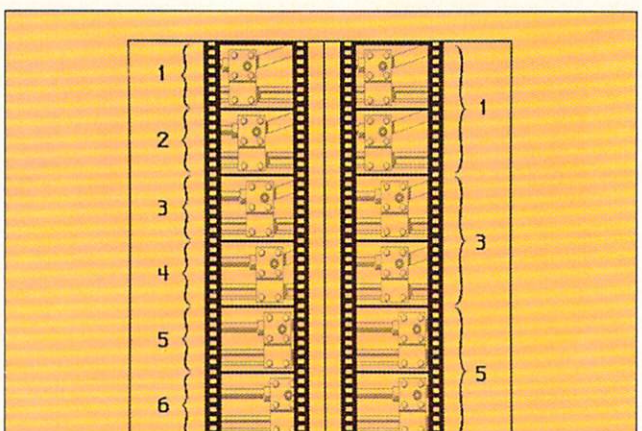


Figure 1. In this detail from the steam-engine animation, the frames on the right show the technique of "running on twos."

One solution to the dilemma is to double up on frames, which traditional animators refer to as "running on twos." Halving the number of frames drawn and shooting each frame twice will cut your effective frame rate in half.

Figure 1, showing a detail from the steam-engine animation that is depicted below, illustrates the technique. The engine consists of a piston rod driving a wheel with a heavy counterweight. To achieve the smoothest result, the movement of the piston rod over one second should occupy 24 separate frames of film. Running on twos cuts this down to twelve sets of two frames, but note that this reduces our effective frame rate to 12 fps—a figure below the minimum 16 fps needed to perceive motion. Consequently, the 12 fps version appears "jumpy."

The situation is further exacerbated when higher duplication rates are used (sometimes the case with the standard fare of Saturday-morning children's cartoons, which may run on fours, or even fives). In such cases, however, the animation becomes so jerky that one gets the feeling that it really has ceased to be quality entertainment.

Many animations, however, can run at lower frame rates without looking "jumpy" because of the slow speed at which their objects actually move. Slower motion is less demanding on frame rate than fast motion. Thus, having a clear understanding of how the subject of your animation is supposed to move, and then employing a frame rate appropriate to that motion, will help keep your animation tasks from completely overwhelming you.

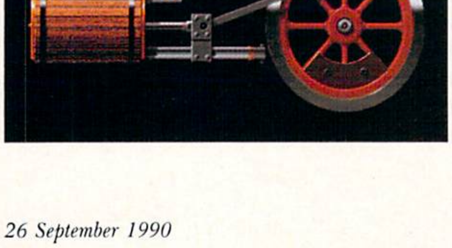
There is one special case we should consider where choosing a proper frame rate is crucial. It involves periodic motion, such as bottles moving on an conveyor-belt, scrolling over a checkered tile floor, or a spoked wheel spinning. Each of these examples involves a repeating pattern encountered at a regular interval. Consider the spoked flywheel in the steam engine animation. As the wheel spins, a sequence of frames passes until the next spoke appears in the position where the first one started, at which point the sequence repeats.

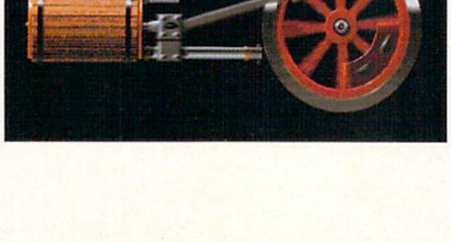
A problem develops, however, if the frame rate is too low: The motion appears to run backwards. This happens because the wheel rotates so fast that each spoke moves close to the one ahead of it between frames. Commonly known as the "wagon-wheel" effect, it takes its name from the frequently encountered scene in many western movies where a wagon wheel accelerates, begins to rotate faster and faster, but then suddenly appears to slow down, stop completely, and then reverse direction.

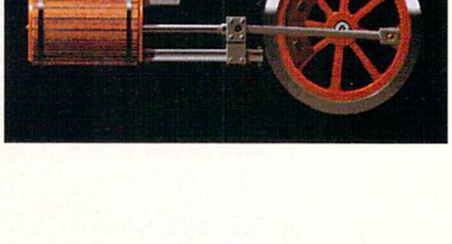
All such periodic motion is subject to this phenomenon. In general, a set of cyclical frames should never complete half of a loop in the time it takes for one frame to pass. Figure 2 shows the eight-spoked flywheel from the steam-engine animation. As the wheel rotates, the spokes form a repeating pattern that requires 45 degrees to complete (360 degrees ÷ 8 spokes). Therefore, the maximum rotation between frames is 22.5 degrees. Beyond this, the spokes appear to slow down until, when the rotation is exactly 45 degrees, the entire flywheel seems to stop. It is crucial that the animator choose a frame rate sufficient to prevent this from happening.

Faster Than a Speeding Bullet: Motion Blurring

As we saw in discussing frame rate, the faster an object moves, the higher the frame rate necessary to accurately represent it. The frame rate increases until it reaches the speed of the medium—film at 24 fps, television at 30 fps. As objects move beyond the limit of the medium, another technique must be employed to keep the motion smooth: motion blurring.







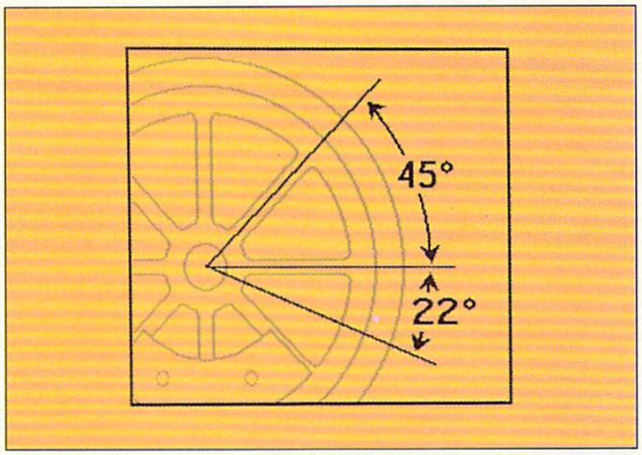


Figure 2. The "wagon-wheel" effect occurs when frame rate is too low. At 8 fps, the flywheel appears to stop because each of its eight spokes rotates one position (45°).

It is commonly accepted that a given frame of animation shows the position of an object in motion at a specific point in time. This is not strictly true, however, because the shutter on the camera does not open and shut instantaneously. All camera shutters are open for a clearly defined fraction of a second. As short as that interval may be, it is still a moment in which a moving object will present not a crystal-clear image, but a blurred one. This is known as motion blur.

Figure 3 shows a close-up of the piston rod of our steam engine moving halfway through its cycle—at maximum speed. Throughout the frame's exposure, the rod moves significantly. In representing the rod as a sharp, static image positioned midway between its starting and ending positions (the top-left section of Figure 3, labeled "Unblurred"), valuable speed information is omitted. But by adding the blur that would occur naturally, the frame will flow smoothly in sequence when projected at normal speed.

Motion blurring has little effect on slow animation. Cases where objects move very little from frame to frame (imagine a baseball player lifting his bat prior to taking a swing at the ball) benefit less from the technique than faster actions (now see the batter actually swinging the bat). Motion blurring is best used to enhance very high-speed motions where the frame rate fails. The swing of the bat may occupy only one brief frame. Represented as a static image, the bat would simply appear in a different position. Represented as a streak, however, it conveys a sense of action.

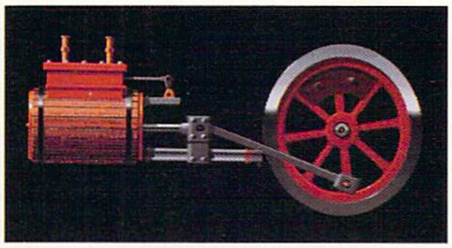
Most animation software does not normally support motion blurring. Two-dimensional, frame-based packages such as DeluxePaint III (Electronic Arts) require the animator to add blur manually to each frame. (In certain instances, you could conceivably automate this process in DPaint by using the Move requester.) Most 3-D rendering packages do not support blurring, either, as the increased calculation time makes already long renderings simply intolerable.

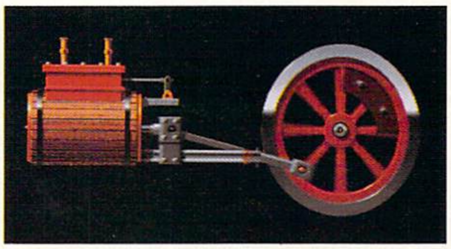
Sculpt-Animate 4D (Creative Computers), however, does have a blurring option that automatically blurs each frame as it is rendered. Rendering time, of course, increases significantly. Methods for manually producing motion blur vary, but the most common involves averaging several discrete frames together in a kind of "multiple exposure" (to borrow a film term), where an object moves just a little between exposures.

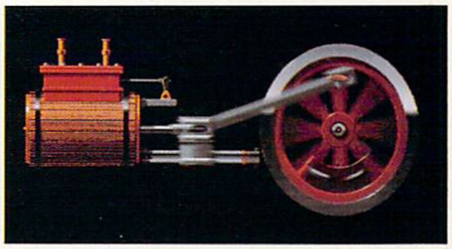
In the full steam-engine animation from which my examples are taken, you would see the way that the piston rod blurs (or, to be more accurate, how it "streaks"). The top-right and lower-right sections of Figure 3 provide two different representations of the piston rod blurring: linear blur and logarithmic blur. If we assume that at the instant the frame starts exposure, the piston moves with fairly constant speed until the frame ends, then a linear blurring should appear. The brightness of any pixel should be directly proportional to the amount of time the pixel was exposed. This would produce a blur in which the piston gets brighter a little at a time until it peaks midway through the frame and then slowly becomes dimmer.

This is fine in theory, but it does not work in reality. When film is exposed, the blur does not build gradually in brightness, peak, and then diminish gradually. Rather, the brightness will build rapidly, remain at a constant level for most of the object's motion, and then diminish quickly.

This is why the result is more akin to streaking than blurring. This happens because light exposes film not in a linear, but in a logarithmic fashion. As light intensity increases, exposure response decreases. If an image reaches a certain brightness in a half-second exposure, it will not be twice as bright as ►







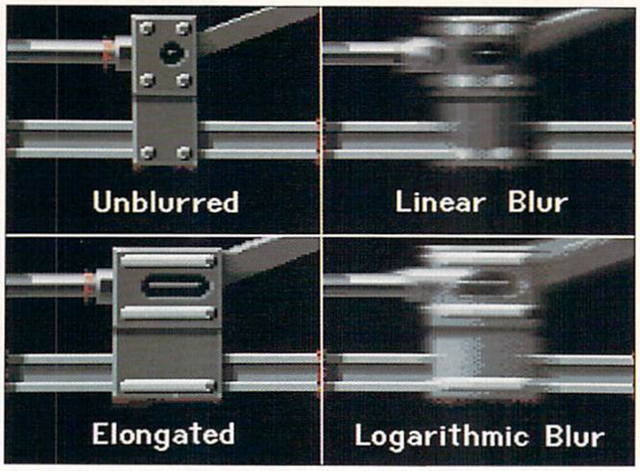


Figure 3. Four representations of the steam engine's piston rod moving at maximum speed.

an image exposed for a quarter-second. As exposure time increases, more and more light is needed to produce a change in exposure. (Or, as is the case when using a camera, as you increase your exposure time while light intensity remains the same, there will be less change in exposure.)

The upshot of all this is that moving objects will tend to streak, which is not quite the same as simply blurring. This is important in understanding the limitations of averaging several frames together. Simple averaging weighs all frames equally, producing only an even blurring—not streaking. What is needed is for someone to write special Amiga software that will make it possible to use a weighted averaging scheme to treat later frames in the exposure as less important.

Before leaving the matter of motion blurring, we should consider a simple alternative to the more complex techniques discussed above. It won't work in all situations, but sometimes elongating an object over several frames may produce a very realistic blurring effect. Consider the lower-left section of the piston example in Figure 3. Because most of the blurred image appears like an elongation of the piston, why not forego the blur and simply redraw the piston elongated? This method actually works quite well in certain cases, such as with raindrops, sparks, and other generally bright objects that move over dark backgrounds.

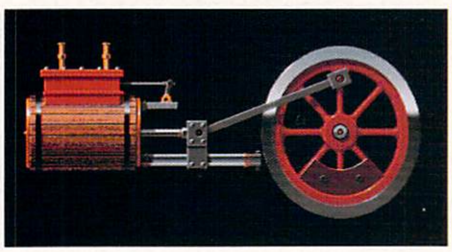
Continuity, Not Constancy: Accelerated Motion

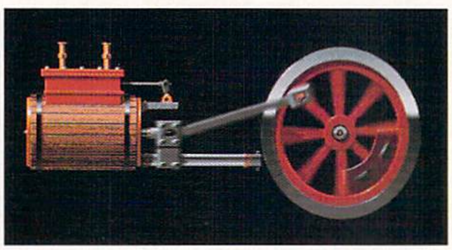
Computer-animation artists rely too heavily on software to move objects. The problem here involves linear motion, that is, movements that occur at regular intervals of time. To understand the difficulties of having computers simulate reality, consider the opposite case: reality simulating a computer. Many popular mime skits revolve around a human being imitating a robot. All of the mime's movements are regular and sharp. An arm or a leg instantly starts moving at a single speed and suddenly stops. This is the nature of linear motion: constant speed without any acceleration or deceleration. Many animation programs are based on the same concept, which can be seen in the way they allow users to define an object's path and the number of frames to be rendered between key-frame positions. The result is a distinctly robotic movement as an object moves from one static position to the next.

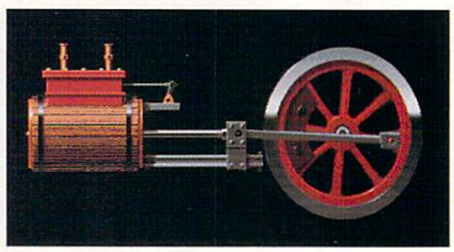
Some animation software tries to smooth out such motion by providing acceleration along a curved path. But a perfect curve with perfect acceleration is still going to look, well, too "perfect." Real-world motion, in particular human movement, incorporates subtle accelerations and decelerations that are very difficult to reproduce.

A traditional animator can flip quickly through several frames to judge timing, which, as in comedy or in politics, is crucial. Computer animators must be prepared to do the same thing. Animation software, however, is often not set up for this. On a personal computer, even a simple wire-frame preview can take several minutes to render—precious time when the vital interaction between the artist and the animation can easily be lost. The trick to creating expressive, subtle motion is to add enough key-frame positions to accommodate the movement needed. When they have had enough observation of and experience in animating, computer artists will then be ready to recognize what is required when new challenges arise.

For instance, if you wish to animate a steering wheel gone out of control and turning violently from left to right and back again, do not simply have the computer render it left for 15 frames, right for 5,







left 10, right 13, and so on. First of all, because this kind of motion is made up of swift, jerking movements, a maximum frame rate is mandatory. Also make sure the wheel decelerates and accelerates for a few frames as it alternates direction.

You will need even more subtle acceleration than this, too. As the car hits bumps in the road, most likely the wheel itself will also vibrate. As the tires hit rocks and ruts, the wheel might suddenly spin in wild rotation at a moment's notice. Then consider that the camera filming this ride will probably be rocking all around. To reflect this kind of movement, you could move the entire screen image up and down slightly from frame to frame. Now you're getting the idea! This car really *is* in trouble. What started simply as a steering wheel turning has now become a car careening off a road. Your animation has impact and conveys emotion to the viewer.

A good example of accelerated-motion technique is illustrated again by the steam-engine animation. It was created in DeluxePaint III, not a rendering package, and so illustrates that the principles of this technique apply to both computer-rendered and hand-drawn animation. The flywheel does not rotate at a constant speed. Instead, to emphasize the heaviness of the counterweight, it accelerates quickly on the downswing and slows to a constant speed during the upswing.

Figure 4 shows the division lines between the frames for one complete rotation of the flywheel. The closer together the lines, the greater the number of frames and the slower the speed. Notice that along the right side (the downswing), the divisions become greater and greater until just past the bottom. This represents the counterweight overtaking the machine and then accelerating as it falls because of gravity. As it starts up the left side, observe how the divisions diminish rapidly in size with the counterweight's deceleration as it now tries to overcome the pull of gravity. At this point, the piston is driving it back up and the divisions become close and evenly spaced (motion is consistent here) until it begins to resume speed near the top, where the cycle begins all over again. The counterweight could be made to appear even heavier by allowing it to rock back and forth at the bottom before the piston gains enough force to drive it back up.

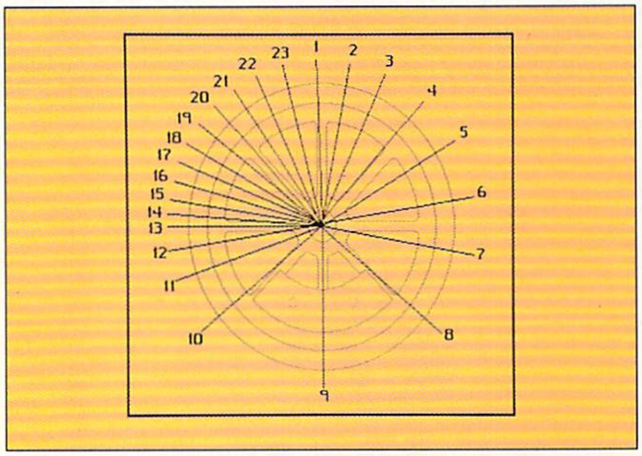


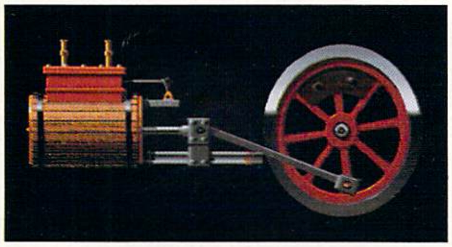
Figure 4. The diagram plots the divisions between the 24 frames of one complete cycle of the steam engine's flywheel mechanism. Smaller divisions mean more frames and hence slower speed.

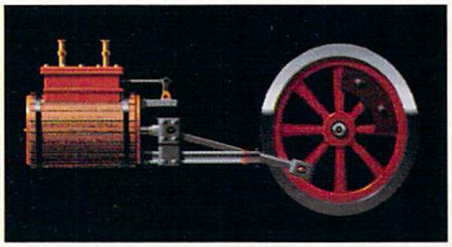
Play It Back, Sam, in Context

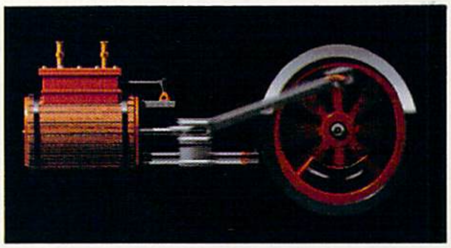
At the base level, animation is merely simulated motion. Yet, in its finest moments, animation can create a wondrous reality that never existed before that instant. Over the years, audiences worldwide have rejoiced in these artificial visions. To an audience, the mechanics of animation are meaningless. Viewers, rarely concerned with how it was done, are perfectly happy enjoying the end results. Traditional animators have been largely unsung heroes with their simple tools of pencil and paper.

In such a context, we should be able to see why computer animation should not be revered just because it was created on a computer. It may be a novelty in the short term, but eventually it must take its place as part of the entire animation process. The computer is just another tool for the animator, and it is valuable to the extent that it allows the animator new possibilities of expression. Just don't forget the broad body of knowledge, technique, and experience that is the real foundation of all great animation. ■

Brian Williams is a computer illustrator for multimedia productions, educational projects, and games. Creator of the Walker demo, he also lectures frequently on art and animation techniques. Write to him c/o AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*







"That Ain't All, Folks!"



When Bugs said "That's All, Folks"

at the end of the cartoon, well. . .that was it.

Not so with your own newly created Amiga animation.

Stay "tooned" for some not-so-loony

advice on animation utilities.

ANIMATORS MIGHT RECOGNIZE Yogi Bear before Yogi Berra, but the old ballplayer/philosopher may have some sage advice on the subject of animation: "It ain't over 'til it's over." You'd know what he means if you have ever spent a lot of sleepless hours creating a wonderful animation only to discover in the cold, critical light of dawn that it needs "just a little changing, a few fixes, some minor additions." Just the thought of redrawing the whole piece or rendering it over again will give you the shakes.

Fortunately for you, your family and friends, and your mental well-being, there is a whole crop of utilities to help you avoid duplicating your entire effort. While the program on which the animation was created might provide the means for making some of the changes you need, there are distinct limits to how much assistance it can give when it comes to all those finishing touches that must be added. Our survey of animation utilities is meant to provide you with a range of specialized tools to help you get your finished animation out in the world well before you start collecting social security.

None of the following utilities is designed to create an animation from scratch, except in some cases by packing together single frames made elsewhere. Their strengths lie in the areas of editing, special effects, and sound synchronization. (Some freely dis- ►

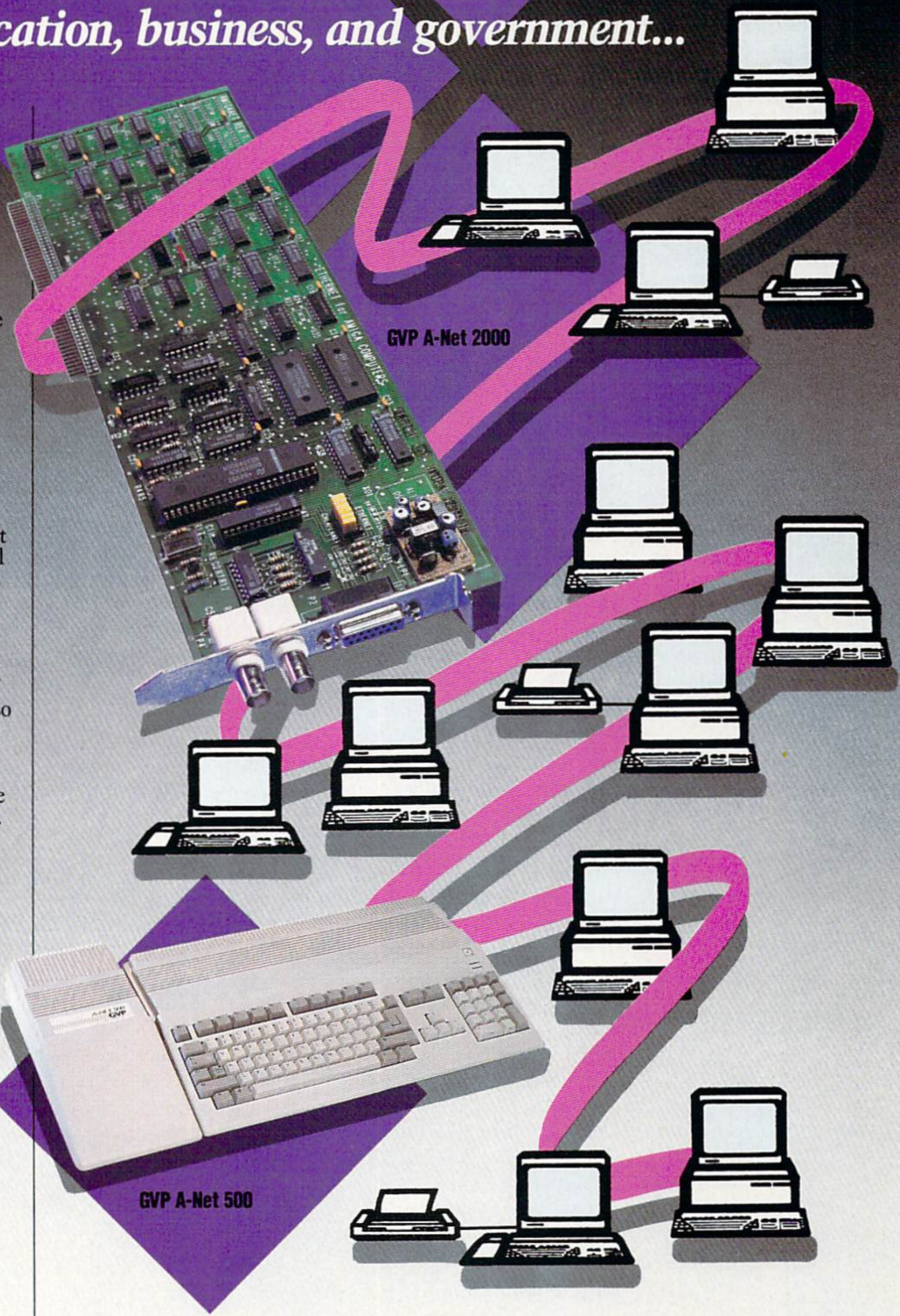
By Michael Hanish

ILLUSTRATED BY JACK TOM

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  - ✓ Ability to run and "Tube" data, quickly between applications on remote stations.
  - ✓ Ability to send messages between users.
  - ✓ Ability to check which users are active on the network.
- Novell and DECnet compatible software drivers available from third parties.

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tributable player programs are also included in the last section of the article.)

Editing functions common to many of these programs include cutting and pasting ANIM files in whole or in part, saving single or multiple frames as IFF files for touch-up in a paint program, and altering palettes and adjusting timing. Special-effects possibilities vary widely among programs—from simply adding a background to some or all of the frames to creating flips, spins, fades, or distortions for that extra spice. Several programs provide the ability to add sampled sound to the animation and to have the sound played back at a preset point.

Our scope is limited to programs that work with the ANIM format—a standard, or at least a common ground, among the wide variety of formats for creating and rendering animations. Where programs have been reviewed fully in previous issues of *AmigaWorld*, there is a reference to month, year, and page at the end of the description of that program.

Complete Dinner Menu—Everything Included

ANIMagic ($99.95, Oxxi) combines the functions of an editor and special-effects generator. The program contains all the basic editing tools, including one of the best palette-editing schemes I have seen, plus a virtually limitless range of effects—once you get used to the somewhat cryptic interface. It works in similar fashion to video digital-effects systems: By using and altering the parameters of the effects maps, you can make your animated images do all sorts of digital gymnastics.

ANIMagic achieves its wide variety of effects, however, at the expense of rendering speed. Because the program does its processing frame by frame, the waits can be long for even relatively simple effects. An accelerator board could provide significant help here, and there is a version of the program optimized for 68020 and 030 processors. *(Apr. '90, p. 12.)*

Animation Station ($99.95, Progressive Peripherals & Software) offers another all-in-one editing and effects package. It sports an icon-driven interface and provides a storyboard-like display that *usually* gives you a clear picture of the contents of each frame of the animation. (When the frames contain a lot of images or when certain colors are used as backgrounds, the storyboard miniatures are not always clear enough to let you know exactly where you are.) The program has a good range of basic effects and renders them much more quickly than ANIMagic.

Animation Station excels at cut-and-paste editing and image compositing. You can lay animations on top, underneath, at either end, or in the middle of each other, as long as their resolutions match. It also allows you to do palette matching and to perform color transitions over time. With Animation Station, you can accurately set the speed for the entire animation, even specifying hold times for individual frames. You can add sampled sounds to your animation and set them to play back at a particular frame. It is quite simple, for example, to cue the sound of a bouncing ball to occur at precisely the moment the ball hits the ground.

Animation Station includes the public-domain program *View*, with which you can play your finished animation—with sound. A number of other useful public-domain tools are also part of the package: *BuildANIM* (constructs an ANIM file from discrete IFF pictures); *SplitANIM* (splits a large ANIM into smaller playable files); *CombineANIM* (merges two ANIMs into one file on disk rather than in RAM); and *ANIMInfo* (identifies file type, format, size, and number of frames). These are also available on PLink at #20049. *(Jun. '90, p. 76.)*

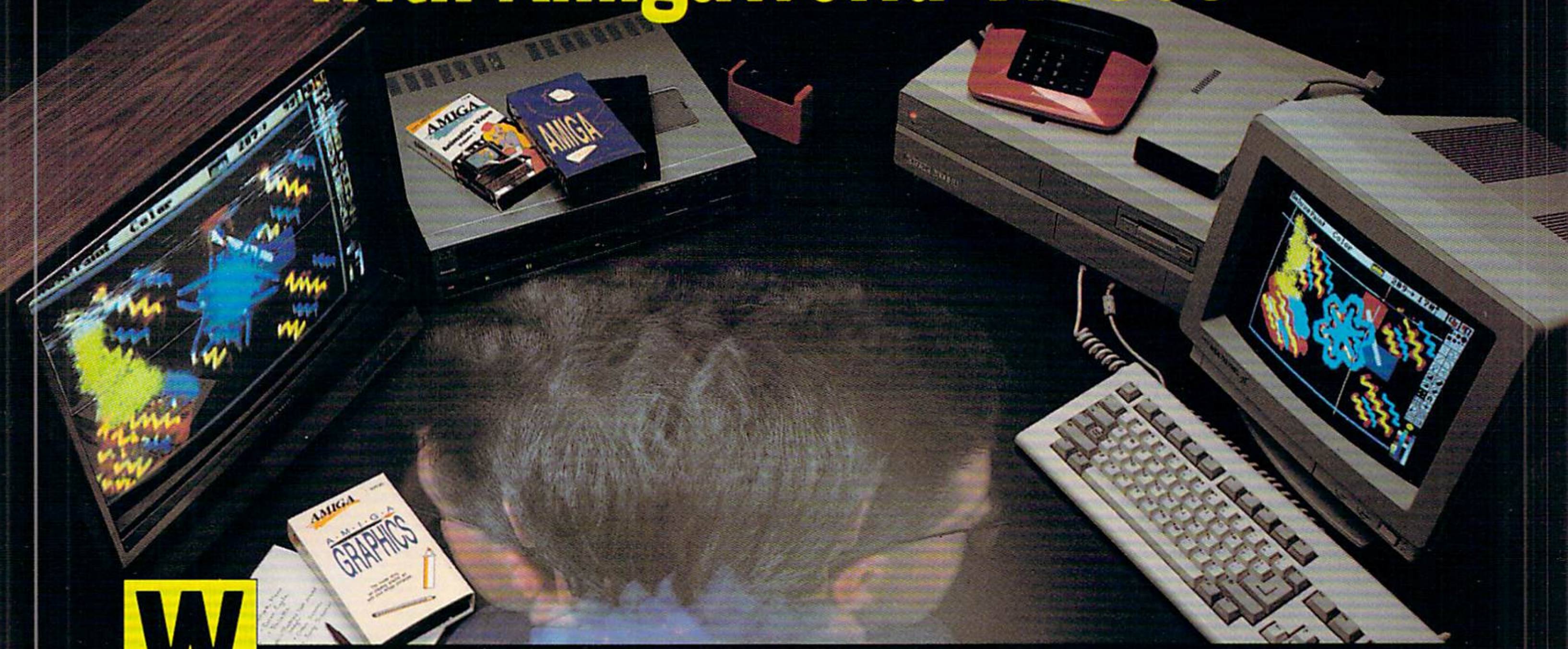
Single-Serving Specialties: Hash

Rather than combining many functions into one large package, Hash Enterprises offers individual editing and special-effects programs under the umbrella of its **ANIMATION:** series. With **ANIMATION:Editor** ($59.95), you can combine and convert whole or partial animation files of different resolutions and numbers of colors into an output file of any resolution you choose. Output options include HAM (but not Extra_ Halfbrite), two degrees of overscan, high and low resolution with or without interlace, three different output-file formats (ANIM, Hash, or IFF), and two video formats (NTSC or PAL).

You can use Editor to cut or paste individual frames or to split an animation into separate IFF files. Color editing is limited—you can convert to black-and-white, and you can make the background color uniform throughout an animation. The package also includes the public-domain utility *Capture* (PLink #14563) for converting Sculpt-Animate (Creative Computers) and Turbo Silver (Impulse) format animations to Hash format (which you can then easily convert to ANIMs in Editor if you wish). The program is fast and simple to use, memory-efficient, and politely multitasking.

ANIMATION:Multiplane (89.95) handles compositing, effects, and color-editing tasks. It works with two "planes"—each one either a single IFF image or a full animation—which can be merged to create such digital effects as strobe, overlay, dissolve, fade, motion blur, pixelation, and color change. The interface pro- ►

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vides full control over the degree and intensity of the effects over time. None of the effects rivals the flashy, full-image spins and swoops of ANIMagic or Animation Station, but all are very effective and can be rendered quickly and smoothly. You have the same wide range of output options as in Editor, making this a very useful, versatile program.

ANIMATION:Soundtrack ($119.95) is a sound-sampling editor and a synchronizing tool for incorporating sounds into your animation. It takes a quite different approach from that of Animation Station, where a particular frame triggers a sample. Here, samples are loaded into memory and then assigned in whole or in part to be triggered at specific times. The resulting soundtrack can then be played back and dubbed onto video, or played simultaneously, using the public-domain player *Display* (see below) and Soundtrack's own *ST Player*. Soundtrack succeeds admirably at its primary function, which is to make lip-synced sound tracks for character animations, because sounds can be edited and "choreographed" in the same program. The sample-editing tools are excellent and accurate.

Perhaps the only drawback to using the program is that you must know the precise time that you want a certain sound to occur within the animation, rather than being able to tie it to a frame you can see. For many tasks, this winds up feeling clumsy. A forthcoming version of Soundtrack promises the ability to sync MIDI files to SMPTE to allow for playback of synchronized music files. *(Other utility modules in the ANIMATION: series include Effects, Stand, Flipper, Rotoscope, and Titler.)*

A La Carte Choices

DigiMate III ($39.95, Mindware International) is designed to work as an animation-creating front end for Digi-Paint 3. It requires the interprocess command language ARexx, which it uses to communicate with the paint program, to build a HAM ANIM file by stamping brushes on successive pages—a technique that works quite smoothly and efficiently. The same method is used to make animated transitions, the patterned replacement of one HAM image with another. With nonHAM animations, the program performs a number of image-processing operations, including edge detection, color conversion to from one to four bit planes in black and white, resize, and mirror. It also provides the usual cut, paste, append, split, and join functions.

DigiMate III is unique in its ability to play an animation directly from floppy or hard disk as well as from RAM. Other programs discussed here must first load the animation into RAM before playing, which increases speed but limits the size of animations to available RAM space. With DigiMate III, I noticed virtually no slowdown when playing lengthy animations from my hard disk. The same may not hold true for floppies, however, and users might be better advised to play animations from RAM, instead. Because of its low price, extremely intuitive interface, overall ease of use, and ability to customize animation files, DigiMate III deserves a serious look from animators. *(Sep. '90, p. 77.)*

Despite its script-based approach and lack of a graphics-oriented user interface (which keep many potential users away from the product), **The Director** ($69.95, Right Answers Group) offers almost limitless animation possibilities and should not be overlooked. Of particular interest to us in this survey is The Director's capability to play back ANIM files in whole or in part with precise control over each frame event.

In addition, its Sound module provides the ability to synchronize sound to any frame. Such features, combined with the fact that you can create transitions on the fly with wipe routines found in **The Director Toolkit** ($39.95), make The Director a very powerful tool for modifying and customizing your ANIMs. The time you spend learning to use this program will be handsomely rewarded. *(Jun. '88, p. 70. A revised version of The Director, release 2.0, is expected this fall.)*

If you are looking for an excellent display program pure and simple, my suggestion is **Elan Performer** ($59, Elan Design). It provides a smooth and easy method to sequence multiple animations and IFF images. Stringing together any number of disparate pieces with different resolutions, you can produce even long, complex shows for display with Performer—and still exercise precise control over timing and enjoy full interactive playback. If you wish to distribute your piece, simply use the public-domain player program included with the package.

Performer also sports a pair of handy additional tools: *AnimSplicer* (to make an animation out of individual frames) and *FrameCutter* (to break an animation into single IFF images). What Elan Performer does, it does extremely well, and for putting together smaller bits into a longer presentation, no other program can match it. *(Oct. '89, p. 90. An enhanced—and more expensive—version of Performer, release 2.0, is promised for September at a list price of $149.)*

Free Lunch, Yes! PD Players

Once you have finished the animation to your complete satisfaction, you will probably start thinking about how to get it out to a deserving audience. If ►

you want the animation to play when its icon is clicked, simply include the player program of your choice on the disk and make it the animation icon's default tool. There are a number of freely distributable programs in the public domain that serve just such a purpose, all of which play back standard ANIM files of all screen resolutions. I have included four representative choices here, each with its locations on GEnie and PeopleLink and its size in kilobytes (a factor you must consider, because player programs eat up disk space that could otherwise be used for the animation itself).

In discussing Hash Enterprises' ANIMATION: Soundtrack above, we alluded to **Display 3.29** (GEnie #7788, PLink #19380; 34.4K). In conjunction with Soundtrack's own ST Player, it will play back an animation with the associated audio files. It features adjustable speed, a draggable playback screen, single-frame advance and reverse, and the ability to play animations from several disks as if they were one continuous piece. Another player program, but accessible only from the CLI or as the default tool, is **ShowAnim 5.04-02** (GEnie #5811, PLink #17939; 39.3K), which permits you to specify the number of loops, color cycling, and timing.

Able to work from either the CLI or Workbench, **SuperView 3.0** (GEnie #6976, PLink #19417; 9.5K) provides keyboard controls that allow you to turn color cycling on and off, and to start, stop, or single-step through the animation. You can adjust timing, however, only on start-up from the CLI. A full-featured player/viewer, **View 1.8** (GEnie #6825, PLink #20050; 58.7K) offers a range of playback controls available from the keyboard while the animation is playing. It supports the playback of sounds at specific frames, as described above in the discussion of Animation Station.

Noticeably absent from our list of animation utilities is a tool that allows for the synchronization and playback of song files, either in SMUS or MIDI format. Constructing a music soundtrack out of just sampled chunks of sound wastes too much time and memory. Let's hope someone develops a utility that will enable us to include standard MIDI files or a SMUS score and several instruments with our animations.

As for comparing programs in this survey—with an eye towards making specific recommendations—the problem is that each one performs different kinds of tasks. If I could have only one program among all those presented, it would be Animation Station. Although not perfect, it is very versatile (editing and special effects all in one package), renders very quickly, and is easy to use. The ANIMATION:series offers an excellent collection of specialized tools that perform quickly and easily. The only drawback is that the individual-module approach requires a fairly steep investment as an overall solution. Finally, although it has certain limitations, DigiMate III, a very inexpensive and easy-to-use package, is the only utility that allows you to work with HAM animations and to run animations from a hard disk. ■

Michael Hanish uses his Amiga for video and graphics work with both his performance group, The World Turned Upside Down, and his adult literacy students. Write to him c/o AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Manufacturers' Addresses

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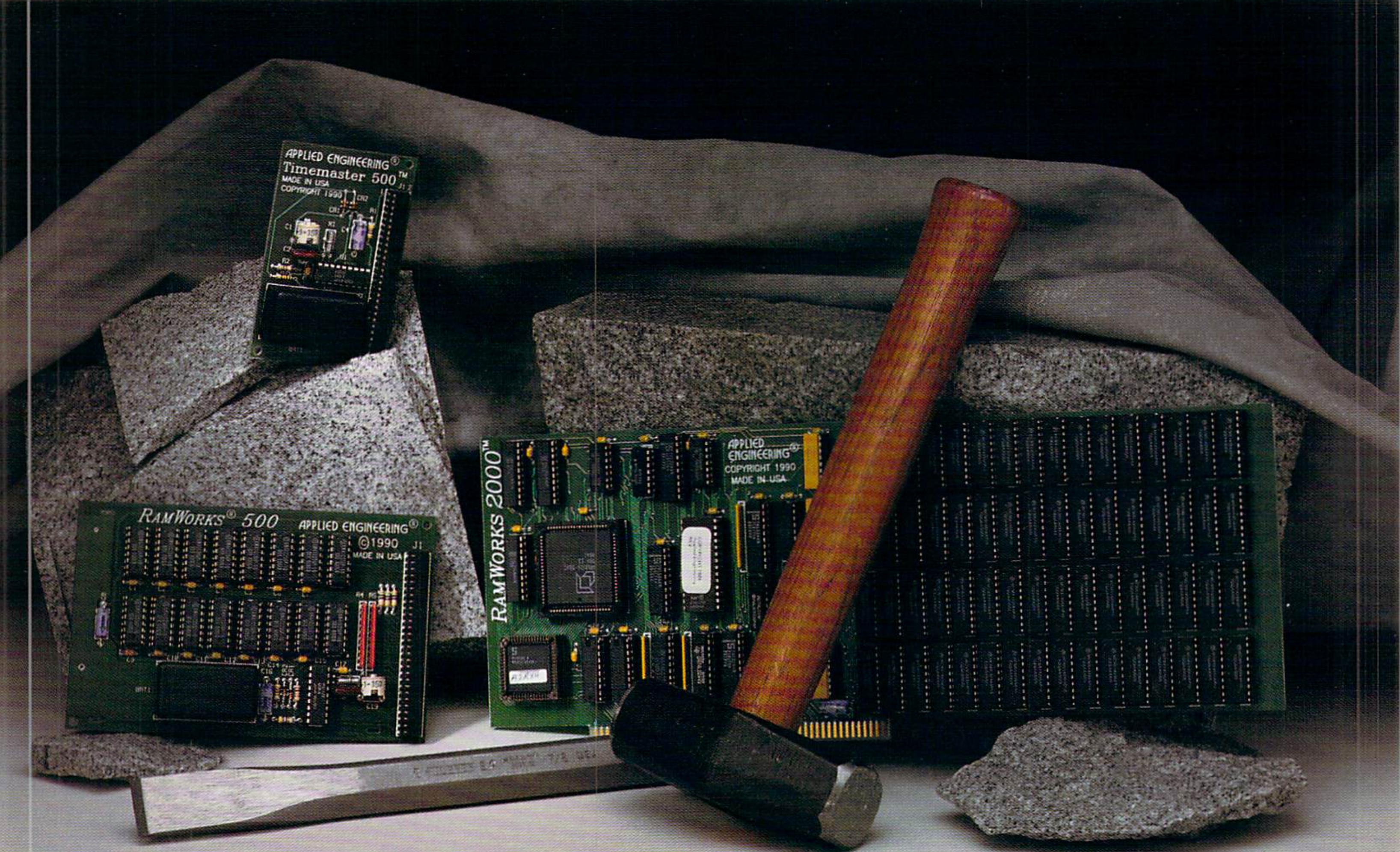
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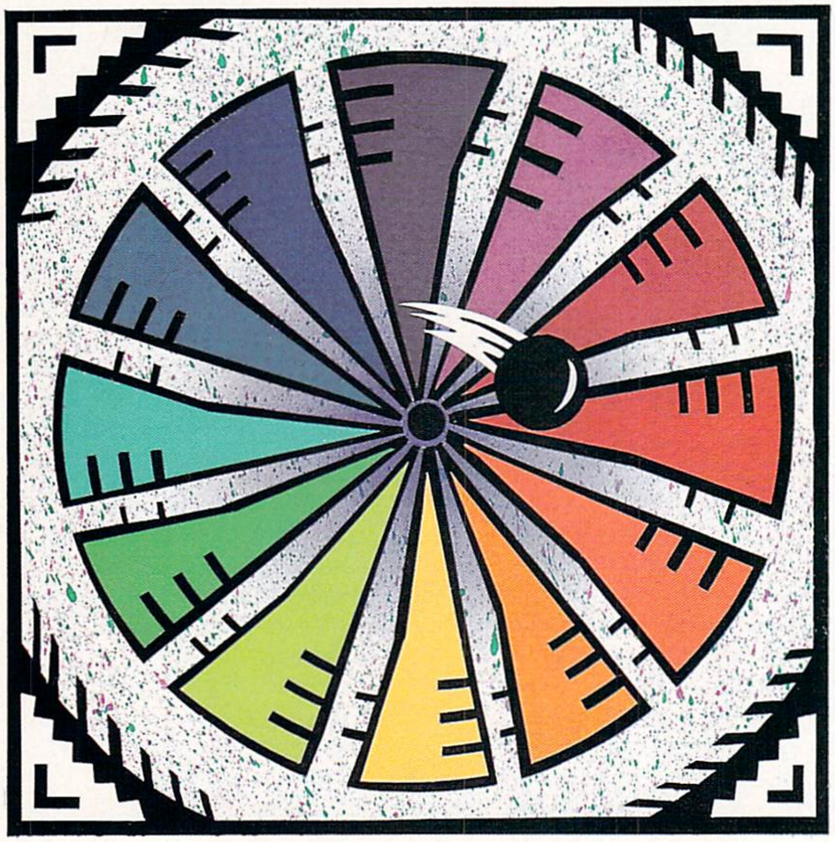
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Rig yourself a color wheel and take the gamble out of selecting the right colors for your palettes.

By Gene Brawn

CAREFUL CONTROL OF color is the key to great art, a key which many people never find. The problem may be that color is not a science, but a free-for-all: There is no "correct" color theory, no "approved" way to mix colors; instead, a plethora of systems presents a wide selection of methods from which to choose your palettes. Uninhibiting, yes; overwhelming, definitely.

Despite the apparent chaos in the world of color, a few color-mixing techniques have withstood the test of time. Most artists' color-mixing schemes are based on the color circle. This is simply a representative sample of the visible spectrum, bent and spliced end to end, on which several useful color relationships can be mapped and diagrammed. The fundamental color relationship is the **complement**: two colors 180 degrees apart on the wheel. Complements are used when the artist needs a strong contrast of colors. Strong contrast is also produced by the **triad**, three colors located 120 degrees apart, such as the primary colors red, green, and blue. For a lower color contrast, use the **split-complement** scheme, created by mixing a dominant color and the two hues on either side of its complement. A **hexad** is formed when six colors, 60 degrees apart, are combined. Remove any hue from the mixture and you have a **pentad** of five colors.



Analogous color schemes result when colors are chosen from a limited arc of the circle, generally less than 90 degrees. Other methods include confining your choice to colors of the same brightness or value, or to colors with a common level of saturation.

Don Your Smock

If choosing the right colors sounds like blind luck or tedious trial and error, take heart. You can use DeluxePaint III ($149, Electronic Arts) or any paint program with color-cycling capabilities to create a "smart" color circle that helps you out. The automatic color circle is simply a color wheel that uses DPaint's color-cycle mode to rotate the colors around the wheel. To the side of the circle are color-test patches with which you can preview any mixing combination and devise pleasing color schemes for your projects. ►

ILLUSTRATED BY ANNIE GUSSMAN

To get you started, we'll create a wheel with triad, split-complement, and double-complement swatches. (See the sidebar, "Cycle By Numbers," for other combination suggestions.)

By convention, the number of hues in an artist's color circle is almost always a multiple of three (all other colors being derived from the three primary colors). While 12-hue circles are most common, ours will have 24 colors to give you a broader choice. Construction is easy: Run DeluxePaint in lo-res 32-color mode, build a rainbow palette, draw a color circle using those hues, create some combination test patches, and turn on color cycling to see the results.

To design your palette, call the Color Palette requester by pressing the p key. If the first two colors in the palette are not black and white (or the default tan), press the Help key to automatically effect these settings. Keeping these colors in the first two positions ensures that the menus will always be visible when they are displayed. Here and in the toolbox, colors are arranged in vertical columns, numbered from top to bottom and ordered from left to right. Color number 1 (now black) is at the top of the leftmost column, while color 9 tops the next.

To create our electronic spectrum, we'll use the requester's Spread function. Unfortunately, this otherwise powerful feature contains a serious flaw: It will not let you produce a palette of the entire spectrum with a single command. DPaint looks for the shortest route through the spectrum to the target color. In other words, instead of always traversing a color circle clockwise, DPaint creates the colors in a counter-clockwise direction if that is the shortest path to the target color. If you try the spread from red to blue, for example, you will get a range of reds and blues in place of the full spectrum! Instead, you must create the colors in smaller steps that correspond to their spectral order.

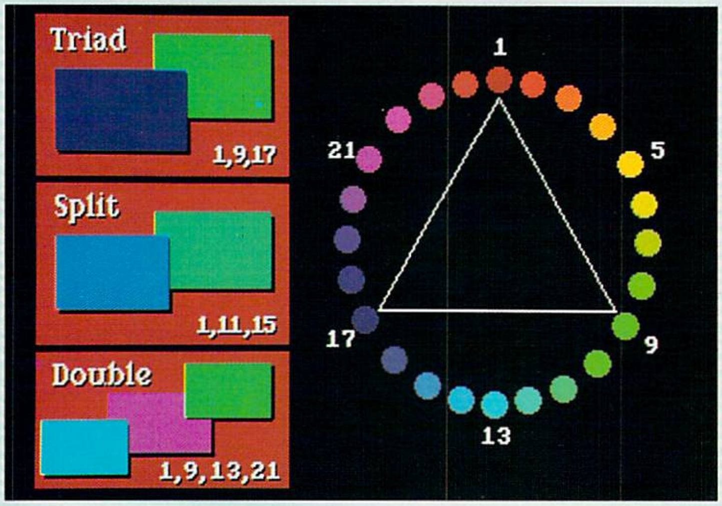
Start the first spread (red to cyan) by clicking on register 3. Use the RGB sliders in the Palette requester to adjust its color. Move the R(ed) slider to the top (15) and the G(reen) and B(lue) sliders to the bottom (0) to create a pure red. Click color 15 and adjust the sliders to read 0,15,15 (cyan). Click the Spread button, then position 3 (red). You should see a gradual transition of colors from red through green to cyan. Finish your spectrum by setting the palette to the following values and spreading between each: Make register 19 blue (0,0,15) and 27 red (15,0,0).

Your new palette colors are now at full saturation, but you can easily alter them. If your projects require pastels or more somber hues, simply adjust the H, S, and V sliders. First, set each of the main registers to the values I previously specified. Before completing each spread, however, set the Saturation (S) slider to about 8 for pastels, or move the Value (V) slider to near 8 for darker colors. Experiment with the settings until you find the levels you like.

Before you close the Palette requester, you need to tell DPaint which colors to use for the operations that follow. First, click on the 1 to the right of the Range button, then on register 3. Click on Range, then on register 27. Click on buttons 2 through 6 and set each of their speeds to 0. Finally, visually check the color-cycle rate and range limits by dragging the speed slider to the right (faster) or left (slower). Release it about one-third of the way from the left side of the box to select a slow cycle speed. Click OK to exit the requester.

Reinventing the Wheel

The next step is to draw the color circle, not as a continuous band of color, but as a circle of 24 small ►



Press the Tab key, and this intelligent wheel cycles through the spectrum.

Cycle By Numbers

BELOW ARE SETTINGS for just a few of the possible color combinations you can create using the automatic color wheel. The numbers refer to the colors' positions on the wheel. Simply use DPaint's Pick command to select the color from the screen when you are drawing the test boxes.

Another, even more useful technique is to draw a sketch representing the elements in your picture, ignoring detail but preserving shapes and relative sizes. Fill these shapes with any of the color combinations you like and color cycle as usual. □

—GOB

Complement	1,13
Split-complement	1,11,15
Double-complement	1,9,13,21
Mutual-complement	1,11,13,15
Triad	1,9,17
Pentad	1,5,9,17,21
Analogous	1,2,3,4,5

"blots," one for each color in our limited spectrum. The obvious way to build the circle is to stamp a brush 24 times to establish the shape, then color each blot with the Fill tool.

Stop! There is a much, much easier way to do this. First, click the right mouse button on the *upper* part of the Circle tool to display the Spacing requester. Click on N Total and set its count to 24. Exit with an OK click. Toggle on Cycle mode with the F7 key or through the Mode menu. Click one of the large built-in brushes located at the top of the toolbox, press the = key three times to enlarge the brush, and select red as the drawing color. Click and drag out a circle of blots about three-quarters of the screen's height. Voilà! We have our 24-color circle.

A closer look, however, reveals a slight hitch: Pure red, which should be at the top of the circle, is located on the right. Of course, DPaint provides a simple way to rotate the colors to their proper positions. Change the range in the Color Palette requester to exclude the last red (register 27), which was needed only to draw the circle, and then exit the requester. Select MultiCycle from the Prefs menu and grab the color circle as a brush, using the right mouse button to leave a clear screen. By pressing the y key, flip the brush so that its colors are properly oriented. Again, press the F7 key to select Cycle mode (which was turned off when you picked up the brush). Press the Right Bracket key (]) until red rotates to the top of the wheel, then stamp the brush on the right side of the screen to make room for your test patches. Reset the Spacing requester to Continuous and press F2 to return to the normal color-drawing mode.

With the wheel complete, we are ready to create the test swatches. Most color schemes have one color that dominates the composition; in our patches this will be the hue in position 1, which is pure red to start with. Select it from your palette and draw three backgound rectangles along the left side of the display, each about one-third of the screen in height. Make the first a triadic test patch, consisting of colors 1, 9, and 17, as the triangle in the illustration shows. Add smaller green (color 9) and blue (17) boxes inside the top-left rectangle, and label it Triad. In the next box, repeat the process for the split-complement, adding colors 11 and 15. Finally, add the hues for the double-complement (9, 13, and 21) to the third. Pressing the Tab key slowly cycles the colors in the boxes in concert with the rotation of the color circle, letting you evaluate the available combinations. Use the Speed control in the Palette requester to check the pace of rotation, adjusting it as necessary.

Pretty and Productive

You may have noticed a small problem: The color circle always resets to its original state once color cycling is turned off. If you cannot save your selections, this color circle is nothing more than a toy. As a solution, try the following: Grab a test patch as a brush, press F7, and use the] key and MultiCycle to cycle the colors. When you see a combination you like, stamp the brush. Creating a new palette from these colors is easy with the palette tool. You can streamline the process if you save the color tests as brushes. Then, you can use them whenever you need to create a new palette. Simply load the appropriate brush, invoke the Use Brush Palette command, and MultiCycle through the spectrum to your heart's content.

The automatic color wheel is a powerful tool, but it is only the first step towards creating an effective palette. You have selected, at most, six colors on which to base your color scheme. Now you must add subtle shadings and values to these colors to create a truly useful palette. Consult the bibliography, "Colorful Reference," for more advice on palette choices and color theory. ■

Gene Brawn is an interactive-multimedia producer and a contributing editor. Write to him c/o AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Colorful Reference

A Book of Colors
Shigenobu Kobayashi
Kodansha International
New York, 1987

The Basic Law of Color Theory
Harald Kueppers
Barron's
New York, 1982

Colour
Edited by Helen Varley
Marshall Editions Limited
London, 1980

Color Mixing by Numbers
Alfred Hickethier
Van Nostrand Reinhold Company
New York, 1969

Interaction of Color
Josef Albers
Yale University Press
New Haven, 1975

Principles of Color Design
Wucius Wong
Van Nostrand Reinhold Company
New York, 1987

Theory and Use of Color
Luigina De Grandis
Harry N. Abrams Inc.
New York, 1986

The World of Color
William F. Powell
Foster Art Service Inc.
Tustin, CA, 1984

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Command Performance

This hat trick of customized scripts created with AmigaDOS commands will give you three ideas on how to start working your own magic.

By Loren Lovhaug



HOW WOULD YOU like a free operating system upgrade that does not: require a knowledge of C, BCPL, or assembly language; render any of your software incompatible; or necessitate a visit to an authorized Commodore service center? Your c: directory of CLI commands provides the tools to create scripts (ordered groups) of commands that can automate repetitive actions and can even perform tasks not previously accomplished by AmigaDOS.

The basic scripting requirements are a text editor or word processor that can save ASCII files, and a clear idea of the script's function. Start by writing a plan of your thoughts that identifies exactly what you want your script to do and breaks your task into as many component parts as possible. These preliminary steps make it much easier to choose the proper AmigaDOS commands. As inspiration for your own scripts, I'll walk you through the plans, methodologies, and implementations for three sample scripts.

1. Doubletime: The *DATECOPY* Script

The fact that AmigaDOS automatically stamps the current date into each file that you save to disk opens up a convenient way to copy files on the basis of their creation dates, as well as their names. Let's create a script for a new command, DATECOPY, that will allow you to specify a time period as one criteria for copying files. The syntax of DATECOPY will be as follows:

```
DATECOPY source TO destination SINCE date
  UNTIL date
```

As in the AmigaDOS COPY command, "source" in this connection specifies the pathnames and filenames (including wildcards) of the files you wish to copy, and "destination" indicates the device and directory where the files should finally end up. The SINCE and UNTIL date parameters let you limit your copying to files that were created after, before, or during a specified time. The date entries must be in the standard AmigaDOS date format or day-of-the-week notation (yesterday, today, Monday, and so on). For example, to copy from df0: to RAM: files whose names begin with R and that were created between March 10, 1990, and yesterday, enter (on one line):

```
DATECOPY df0:R#? TO ram: SINCE 10-MAR-90
  UNTIL yesterday
```

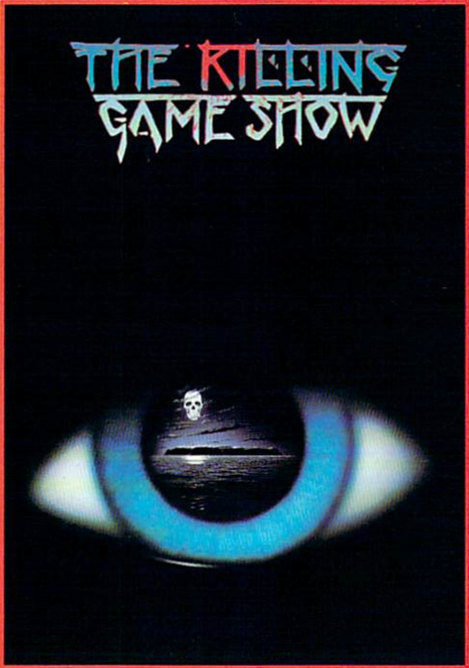
To eliminate some typing, you can omit one or both of the SINCE and UNTIL parameters. Using UNTIL without SINCE tells DATECOPY to copy files dated from January 1, 1980, to the date you indicate with UNTIL. Specifying SINCE without an UNTIL parameter instructs DATECOPY to duplicate files dated from the day you specify up to (and including) today. If you omit both the SINCE and UNTIL parameters DATECOPY copies files created between January 1, 1980, and today.

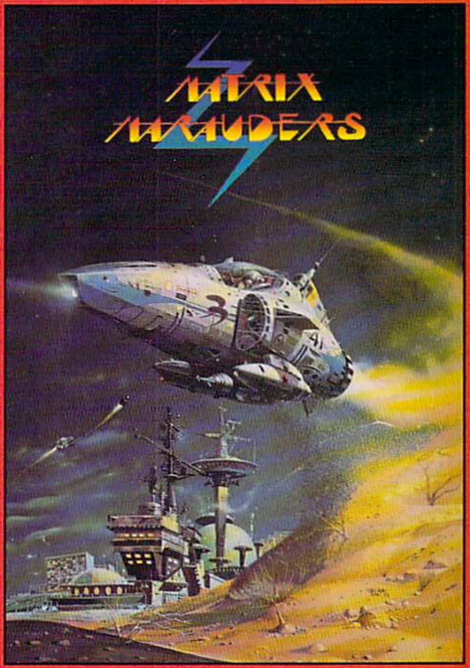
The task's component steps are:

1. Get the source, destination, and dates from the user.
2. Set the defaults for the SINCE and UNTIL parameters. ►

ILLUSTRATED BY JOHN URSINO













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3. Create a list of files that meet the file and date criteria.
4. Copy the files.

The corresponding script is:

```
.key SOURCE/a,TO/k/a,SINCE/k,UNTIL/k
.def SINCE "01-Jan-80"
.def UNTIL "today"
ECHO "Copying from <source> to <to> since
  <since> until <until>"
LIST >t:templist <source> LFORMAT=
  "COPY %s%s TO <to> CLONE" SINCE <since>
  UPTO <until>
EXECUTE t:templist
DELETE t:templist
```

(Do not break the ECHO and LIST commands as was necessary here; type each one on a single line.)

To get the file specifications from the user, the script employs a technique called parameter substitution. Scripts requiring user-supplied parameters must begin with a .key directive, which tells AmigaDOS how much information the user may or must supply and declares the keywords that describe the information within the command script. The /a codes following the names of the SOURCE and the TO (destination) parameters in the .key directive tell AmigaDOS that the user must supply these parameters for the script to function properly. The /k codes after the last three parameters tell AmigaDOS that the user must type the words TO, SINCE, and UNTIL when supplying these parameters. Because the SINCE or UNTIL parameters can be ommitted, the user must type the appropriate keyword to identify either parameter. For clarity's sake, the script also requires the user to type TO before supplying the destination device. The .def statements specify default definitions for the SINCE (January 1, 1980) and UNTIL (today) parameters in case no values are supplied.

At this point, the ECHO command displays a message on the screen informing the user that the duplication process is about to begin. The angle brackets (< and >) in the command identify the parameters specified in the .key directive and tell AmigaDOS to substitute the information that the user supplied for the name of the parameter when it performs the command (in this case, displays on the screen).

In the next step, you use a technique called output redirection and some obscure, but handy, options of the AmigaDOS LIST command to compile a list of files to copy. Output redirection sends command output that would normally appear on the screen to a disk file or logical device. In the case of DATECOPY, use the >t:templist syntax to redirect LIST's output to the templist file in the t: directory. (The standard startup-sequence for the 1.3 operating system creates t: automatically.)

Now the obscure options come into play: LIST has the unique ability to filter files according to creation times via the command's SINCE and UPTO options. Therefore, you can simply tell LIST to use the values of the SINCE and UNTIL parameters as filters. In addition, LIST's LFORMAT option lets you customize the output that LIST creates. In this case, you instruct AmigaDOS to embed the filenames that match the user's criteria and the files' destination into a COPY command and output it to the t: directory's templist file. For example, if the script located the file named "articletext" on df0: and the user wanted it copied to RAM:, the customized LIST command would output the following line to the file t:templist:

```
COPY df0:articletext TO ram: CLONE
```

This technique fills templist with the appropriate COPY commands. When executed (via EXECUTE t:templist), the COPY commands will duplicate all of the files that meet the specified criteria at the proper location. Notice that each of the COPY commands uses the CLONE option to preserve the original date-and-time stamp for each file. The last line of the script deletes the now-expendable templist file from the t: directory.

2. Leave on Time: The *DATEDELETE* Script

Now that we can copy files by their creation dates, let's write a similar script that *deletes* files based on their creation dates. The syntax for DATEDELETE is:

```
DATEDELETE source SINCE date UNTIL date
```

As with DATECOPY, you can omit the SINCE and UNTIL options. Unlike its duplicating cousin, however, DATEDELETE displays the targeted files' names and asks if you're sure you want to delete them. If you type y and press RETURN, the delete operations begin; type anything else and the command script aborts.

The implementation steps are:

1. Get the source and dates from the user.
2. Set the defaults for the SINCE and UNTIL parameters.
3. Create a list of files that meet the file and date criteria.
4. List the files slated for deletion.
5. Ask user to confirm deletion.
6. Delete files and exit, or simply exit.

The script of DATEDELETE is constructed almost identically to that of DATECOPY, as you can see:

```
.key SOURCE/a,SINCE/k,UNTIL/k
.def SINCE "01-Jan-80"
.def UNTIL "today"
LIST >t:templist <source> LFORMAT="DELETE
  %s%s" SINCE <since> UPTO <until>
LIST <source> SINCE <since> UPTO <until>
ASK "Are you sure you want to delete the files?"
```

```
IF NOT WARN
   ECHO "Delete operation aborted."
   SKIP done
ENDIF
EXECUTE t:templist
LAB done
DELETE t:templist
```

(Do not break the first LIST command as shown; type it on a single line.)

While paralleling DATECOPY in constuction, the DATEDELETE script illustrates two new concepts. First, it uses the ASK command to solicit user input; then, it uses the IF. . . ENDIF , SKIP, and LAB commands to alter the script's execution flow in accordance with the answer. The ASK command displays a prompt message to double check that the user really wants to delete the files, and it pauses the execution until it receives a response. If the user responds by pressing y and RETURN, AmigaDOS sets the condition flag to its "WARN" (=5) state.

You test for this state using the AmigaDOS IF. . . ENDIF command's WARN option. If the IF clause is true, then the script executes, in order, the statements between IF and ENDIF; otherwise it ignores these commands. In the DATEDELETE script, if the NOT WARN condition is true (the user pressed anything but y), the script performs the SKIP command. SKIP tells AmigaDOS to jump ahead in the script until it finds the specified label (done) in a LAB statement. If NOT WARN is false (the user pressed y), AmigaDOS performs the statement immediately following ENDIF, in this case EXECUTE t:templist, which deletes the files.

3. Timed Reactions: The *WAITCOPY* Script

The final example script, WAITCOPY, takes advantage of both the Amiga's built-in clock mechanism and its ability to multitask applications. WAITCOPY sits in the background and copies all of the files you specify to the directory or device you wish at the stated intervals. If you like using the RAM: disk as a temporary storage device because of its speed and convenience, but want a little added protection from blackouts, temperamental children, and visits from the guru, you will appreciate WAITCOPY. The syntax for the command is:

```
WAITCOPY source TO destination time
```

For example,

```
WAITCOPY ram:#?.txt TO df0: 5
```

would copy all of the files in RAM: that end with the suffix .txt to df0: every five minutes.

To stop WAITCOPY, click the CLI window in which it is running and type the CTRL-C and CTRL-D break sequences to exit the script. The script automatically defaults to a copy interval of 10 minutes if you do not specify the time.

Broken down, the tasks are:

1. Get the source, destination, and time intervals from the user.
2. Wait the specified time interval.
3. Copy all of the files from the source to the destination.
4. Display a message reporting when the last copy occurred.
5. Loop back to step 2.

The script to accomplish these is as follows:

```
.key SOURCE/a,TO/k,MINS
.def MINS "10"
LAB start
WAIT <mins> MINS
COPY <source> TO <to> ALL CLONE QUIET
ECHO "Last save of <source> to <to>:" NOLINE
DATE
SKIP start BACK
```

Obviously, one of the keys to WAITCOPY is the WAIT command, which pauses script execution for the specified number of minutes or seconds. Without the surrounding loop of SKIP and LAB, however, the script would wait and copy only once. As in the DATEDELETE script, the LAB command identifies a point in the script to which SKIP should reroute the execution flow. This time, the label precedes the skip instruction, so you use SKIP's BACK option to tell AmigaDOS to look for a label before the present line. You loop execution to an earlier command and there begin the wait, copy, and notify cycle again.

Protected for Execution

After saving the above scripts to your c: directory as ASCII files, one more step remains before you can use them as you would standard commands. While you can run them now, to do so you must type EXECUTE and the command's name, instead of simply the command's name. To make your scripts executable like all the other c: commands, you must set the script and execution protection bits for each with the PROTECT command. For example,

```
PROTECT c:DATECOPY +SE
```

sets the proper bits for DATECOPY. Simply repeat the process for the other two scripts, and your new commands are ready to use.

Merely typing in these examples will not give you the ability to create elaborate AmigaDOS command scripts, but studying them will reveal some of the subtle and indispensable techniques on which you can build. ■

Loren Lovhaug, a frequent contributor to Amiga and C-64/128 publications, is also a sysop on the Quantum Link and GEnie networks. Write to him c/o AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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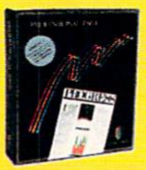
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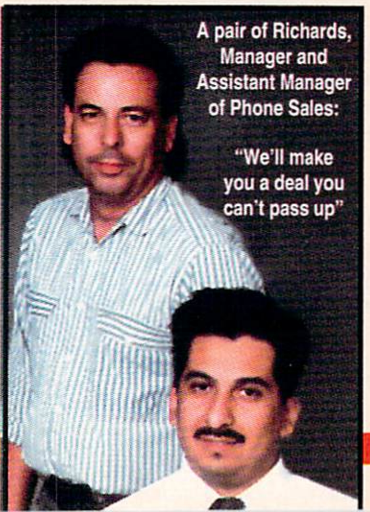
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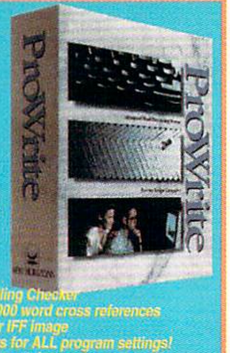
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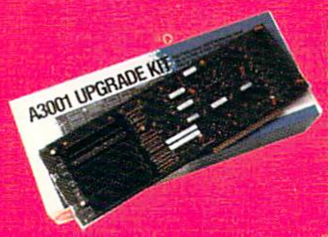
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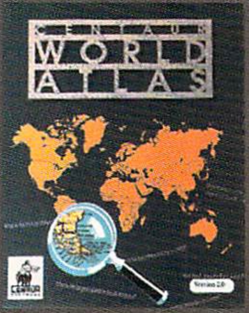
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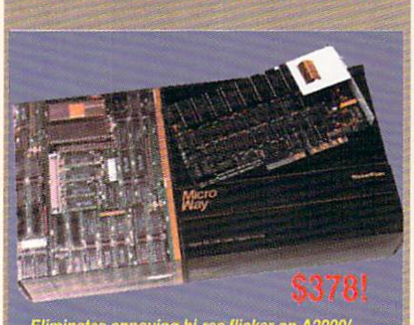
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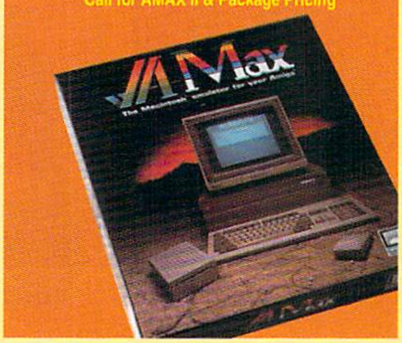
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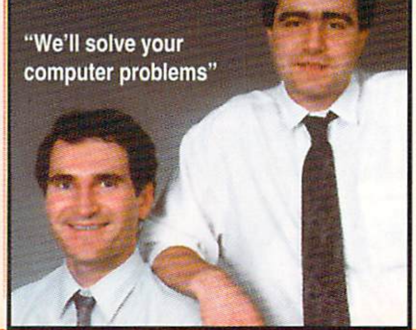
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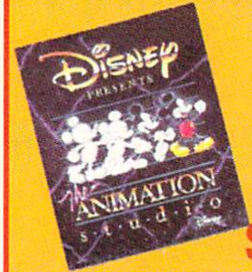
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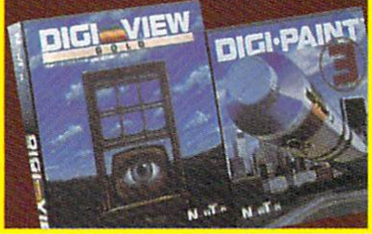
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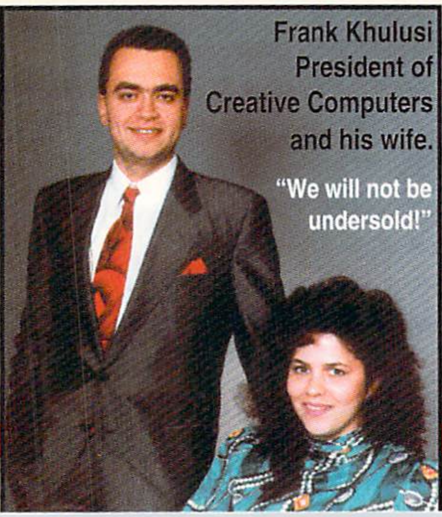
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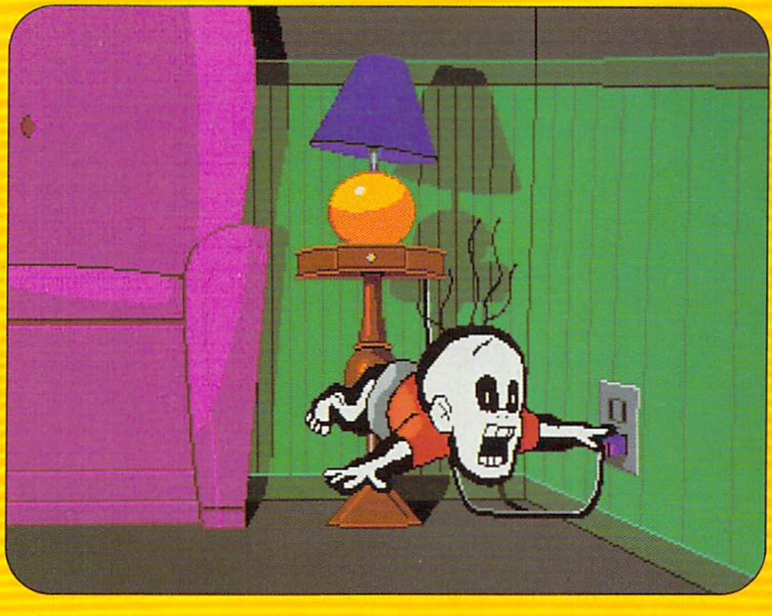
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#19

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

Secrets of Multiplex "Unmasked"

By Joel Hagen

THE IDEA FOR this technique came to me while repairing a toy. The toy had a molded plastic screen composed of a horizontal grid of fine prisms. By slowly turning a scroll of paper inside the toy, you could produce animated images to view through the screen. The images on the paper were broken up into interlaced strips coinciding with the areas transmitted by the plastic screen. The technique is an old one, used in "3-D" postcards and "animated" buttons. Within half an hour, I had a variation of this concept working on the Amiga. It's a fun trick with interesting practical applications, and it's almost guaranteed to elicit the coveted "Wow!. . .Howdjadothat?" accolade from your friends.

On the Amiga, the idea is to break several images into vertical strips and then combine them. The resulting composite is unrecognizable until you superimpose a mask on it that reveals only one set of image strips at a time.

In the accompanying illustration, such a mask is shown "decoding" the image. The mask blocks three of the four vertical strips, allowing only one image to be seen. To the upper left of the mask is a magnified area of the eye showing the mask in place. There are many ways to arrive at this result, but for our purposes we will concentrate on one specific method in **DeluxePaint** ($149.95, Electronic Arts).

Masking Master and Composite Images

Begin with four medium-resolution images that share the same palette. I used four black-and-white faces in my example. Load one of these into DPaint to load the palette. Clear the screen and enter the Magnify mode by pressing the m key. Choose four colors whose locations in the palette are easy to remember. Using a single-pixel brush, select each of these four colors in turn and place a pixel on the screen in a horizontal line. The finished line should be four pixels long, with each pixel a different color. The number of pixels corresponds to the number of images that you want composited.

Using the Brush tool, cut out these four pixels as a brush. The cut must be precise, picking up only the four pixels. In the Fill requester, select Pattern From Brush. Return to the screen, turn off all menu bars and fill the screen. If you examine the filled screen under magnification, it should be composed of vertical stripes. (If it is not, you probably picked up some surrounding area when you cut the four-pixel brush.) Save this master masking screen.

Load picture 1. Switch to the spare screen and load the master mask screen. Go to the Stencil requester, select the color of the first stripe on the mask screen and Make Stencil. Press the j key to switch back to the image screen, then the " ‘ " key (above TAB) to turn the stencil on. Set the background color to color zero and select Clear Screen. The picture should now be a series of vertical stripes, but still perfectly recognizable. Toggle the stencil off by again hitting the " ‘ " key and save the new image.

Repeat the entire procedure for the other images. For each image, of course, you must create a unique mask from the master screen. With the second image, for example, choose the color of the second stripe in the Stencil requester, and so on for all of the remaining images. In this way, each processed image is finally composed of vertical stripes in adjacent locations.

Referring now to the processed strip images you have just completed, load image 1. Switch to the spare screen and

Mastering the masking technique in creating multiplex images opens up some nifty animation possibilities.

load image 2. Under the Picture menu, go to Spare and select Merge In Front. Because the spaces between vertical strips are color zero, the two images merge cleanly to the same screen. Press the j key to load image 3. The composite is preserved on the hidden screen. Select Merge In Front again to combine the three images. Repeat these same two steps to complete the composite and save your "multiplex" image.

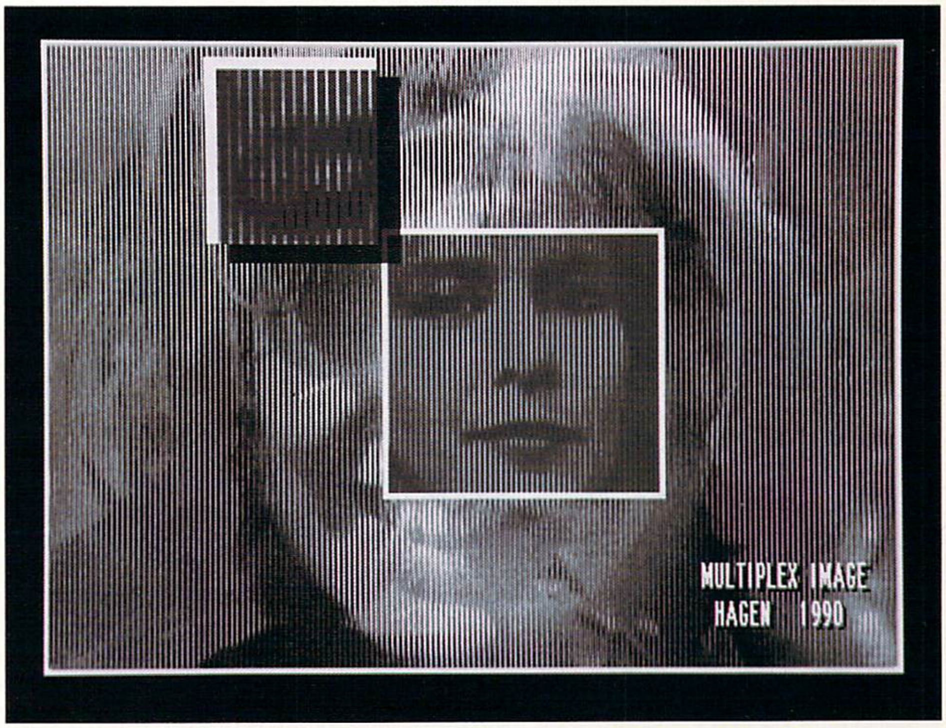
BRINGING IT ALL INTO "VIEW"

You now need to create a lens with which to view the image. (I'm using "lens" figuratively here—what you are really doing is making a brush that masks three out of every four vertical strips on the multiplex image. You can then move this brush around the image to "decode" it for viewing.) Load the master masking screen you made earlier. In the Stencil requester, select one of the four strip colors and Make Stencil. Returning to the screen, be sure that the current background color is not the stenciled color. Clear the screen and turn the stencil off.

The screen is now alternating vertical strips of 1-pixel and 3-pixel widths. Make the background color that of the single-pixel lines and cut a fairly large brush for a test lens. The single-pixel lines will be "holes" in the mask through which you can view the multiplex image. Save the entire screen as the "lens" screen for future use.

With the lens brush still attached to the pointer, load the multiplex image. As you move the lens brush around the image, the pictures will pop into view one at a time, a very interesting effect. To affect the color or value of the overall image, press F2 (Color mode) and select different colors for the lens brush.

Another interesting trick you could perform while moving the brush is to press SHIFT-G to set the grid to your current position. This locks you to a moving window over a stable image. Use the g key alone to toggle the grid off.



This example shows a composite of four faces with the viewing "lens" masking all but one image. A magnified area of the eye is shown at the upper left.

The example uses four images in medium resolution. You will probably find lo-res too coarse for image clarity, but I have composited as many as nine recognizable images in hi-res using horizontal as well as vertical strips. Apart from DPaint, I am also experimenting with the multiplex technique in The Director ($69.95, Right Answers Group) to pack four times as many hi-res images into a single chip-RAM buffer. I can BLIT (The Director's partial-screen page-flipping command) a mask over the multiplex image and then BLIT the decoded image into the display. If the images are sequential, interesting animation possibilities open up.

Other multiplex uses might include encryption and decryption with a shared unique mask. Or, how about single-screen comics with a viewer lens? This is a fun technique awaiting some brainstorms; send me any interesting demos with multiplex images, and I'll report on the best in a future column. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

ColorFont Structure

By Betty Clay

VERSION 2.0 OF the system software adds a new look to the fonts directory—color. Now a system standard, ColorFonts are compatible with older fonts, but require a few additions to the font structure. ColorFont files consist of the same three parts as a disk font's file: a FontContents file (the name.font file), a directory bearing the name of the font, and one or more font-definition files. The definition files contain the actual font, which is named with the number denoting the font's height. As an example of how the system handles ColorFonts, we'll examine the files and structures for a ColorFont named Quest/ 14.4C (available from Library 14 of CompuServe's AmigaArts Forum in the file called SFONTS.LZH).

The ColorFont Structure

When you ask for a font by name, the system looks first for the FontContents file. This little file contains only the font's name, the directory path to its description, its size, and the flags describing its attributes. The FontContents file leads the system to the directory containing the desired font, and then to the font having the correct size, style, and so on within that directory. The example structure below describes the Quest ColorFont in C:

```
struct ColorTextFont {
  struct TextFont ctf_TF;
    UWORD   ctf_Flags;        /* extended flags */
    UBYTE   ctf_Depth;        /* number of bit planes */
    UBYTE   ctf_FgColor;      /* color that is remapped
                                 to FgPen */
    UBYTE   ctf_Low;          /* lowest color repre-
                                 sented here */
    UBYTE   ctf_High;         /* highest color repre-
                                 sented here */
    UBYTE   ctf_PlanePick;    /* PlanePick ala Images */
    UBYTE   ctf_PlaneOnOff;   /* PlaneOnOff ala Images */
    struct ColorFontColors *ctf_ColorFontColors; /* colors
                                 for font */
```

As you can see, a ColorFont file begins with the same font structure (struct Textfont) as does a standard disk font's file, but has additional items to handle the color. So that you can understand the font's construction, we will begin by examining the bytes of a hexdump of the Quest file just as the Amiga sees them. The hexdump begins:

```
0000:  000003F3  00000000  00000001  00000000
0010:  00000000  000005BB  000003E9  000005BB
0020:  70004E75  00000000  00000000  0C000022
0030:  1D460F80  00010000  00005175  65737420
0040:  20202020  20202020  20202020  20202020
0050:  20202020  20202020  20200000  00000000
0060:  00000C00  00221D46
```

The system creates a node that, preceding the actual font structure, ties the font into the system lists when it loads the font. $3F3 is the hunk_header block identifier. $00000000 indicates that no libraries need be loaded for this file; $00000001 says that only one hunk need be loaded. If the Quest required more than one hunk, the system would use the next two longwords to store the address of the first and last hunk at loading time. $5BB is the length of the file in longwords. $000003E9 identifies this as a hunk_code, as opposed to hunk_data or hunk_bss. The length in longwords is then repeated.

At 0020, we find a safety feature. $7000 is the machine language instruction MOVEQ #0,D0, and $4E75 is RTS (return from subroutine), which returns you to what you were doing if you try to execute this file with RUN rather than accessing it with OpenDiskFont( ). The two longwords of zeros are place holders that allow the font to be linked into the list of loaded disk fonts. This list originates in the DiskFontBase Library structure, which you must open when a program accesses a disk font; the system places each font opened into the list. The longwords here will be replaced by pointers to both the preceding and succeeding fonts in the list. (Obviously, the system cannot know these addresses until it loads the font.) $0C is the identifier for a font node, $00 sets the priority at zero, and the node ends with a pointer to the node name. ►

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In the next segment, $0F80 is the font file identifier, and $0001 is the revision number. There follows another empty longword, in which the system's segment address will be stored by the DOS at load times. $5175657374 is the ASCII value of the font's name, Quest, and is followed by place holders to pad out the 32 characters allowed. We then find a repeat of the node structure discussed above. The first one was used to link the font into the system's list of disk fonts; this one links the font to the list of all fonts that are active, and it is part of an Exec message structure. $1D46 is the size of the message—the size of the tables that determine the shape, spacing, kerning, and so on, of the font.

THE TEXTFONT STRUCTURE

The system needs all the preceding information to load the font and link it to the system. The structure that describes every detail about the font immediately follows the loading information:

```
struct TextFont {                          (Hexdump info)
    struct  Message tf_Message;
    UWORD   tf_YSize;                      $0014
    UBYTE   tf_Style;                       40
    UBYTE   tf_Flags;                       62
    UWORD   tf_XSize;                       0012
    UWORD   tf_Baseline;                    000E
    UWORD   tf_BoldSmear;                   0001
    UWORD   tf_Accessors;                   0000
    UBYTE   tf_LoChar;                      20
    UBYTE   tf_HiChar;                      7A
    APTR    tf_CharData;                    000000AA
    UWORD   tf_Modulo;                      007C
    APTR    tf_CharLoc;                     0000140A
    APTR    tf_CharSpace;                   0000157A
    APTR    tf_CharKern;                    00001632
```

Quest/14.4C's hexdump continues with the following lines, which match the items in the TextFont structure above:

```
0060:   00000C00   00221D46   00000000   00000014
0070:   40620012   000E0001   0000207A   000000AA
0080:   007C0000   140A0000   157A0000   1632
```

First, we have the empty holder for the reply message, which becomes necessary when the font is loaded. When all tasks accessing this font have closed it, a message notifies the system that it can remove the font if another task needs the memory.

Next, the structure describes the font in terms that the Amiga can understand. $00000014 gives the height (YSize) of the font. At line 0070, $40 marks the file as a ColorFont (the style). $62, the flags, tell the system that this is a designed font (not a constructed one) and that it is a disk font. $0012 (16+2=18 pixels) is the width, or XSize, and $000E marks the baseline (the line on which the letters "sit") as 14 lines from the top. $0001 calls for BoldSmear, which makes the font appear darker. $0000 is a place holder for the "accessors" of the font.

While the font is loaded, the system increments this count each time a new task asks for the font and decrements it each time a task releases the font. This number must be reduced to zero again before the system can unload the font from memory. $20 tells us that the first character of the font is a space, and $7A indicates that the last character is the lowercase z.

At the end of line 0070, $00AA is a pointer to the bitmap information needed to draw the font, but to find that data, you must add this number to the $0020 which marks the beginning of the font: The bitmap will begin at $00CA. In line 0080 is the Modulo ($007C=124), the length needed for a single row of the font. $0000140A is a pointer to the CharLoc table. Using the same scheme as before, add $0020 to $140A, and you will see that the CharLoc table is found at $142A in this hexdump. $0000157A is the pointer to the CharKern table, at $159A. This structure ends with $00001632, the pointer to the CharSpace table, which we will find in the hexdump at $1652.

TAKE SOME FOR COLOR

For normal fonts, the font data would appear at this point. For ColorFonts, the system knows (because a flag identifies this as a ColorFont) to read the new structure below before drawing the font:

```
struct ColorTextFont {
    struct  TextFont ctf_TF;               (covered above)
    UWORD   ctf_Flags;                     0001
    UBYTE   ctf_Depth;                     02
    UBYTE   ctf_FgColor;                   FF
    UBYTE   ctf_Low;                       00
    UBYTE   ctf_High;                      03
    UBYTE   ctf_PlanePick;                 FF
    UBYTE   ctf_PlaneOnOff;                00
    struct ColorFontColors *ctf_ColorFontColors; 0000009A
    APTR    ctf_CharData[8];               000000AA
};
```

```
struct ColorFontColors {
    UWORD   cfc_Reserved;
    UWORD   cfc_Count;
    UWORD   *cfc_ColorTable;
```

```
0080:                                                  0001
0090:   02FF0003   FF000000   009A0000   00AA0000
00A0:   0A5A0000   140A0000   1DBA0000   276A0000
00B0:   311A0000   3ACA0000   447A0000   00040000
00C0:   00A20000   0ECA0E00   0A00
```

The above portion of the hexdump gives the machine-readable form of the ColorTextFont structure. Much of it is like the Image structure—not unusual, because the Amiga sees fonts as graphics characters. $0001 is a flag, indicating that the ColorTable holds the def-

inition of the designer's colors. $02, the depth, calls for two bitplanes (a four-color font).

$FF gives the color of the foreground Pen. Because a font's colors (in this case four) are numbered starting from 0, the next byte, $00, indicates the number, not the color, of the low color, and $03 indicates the high color. The next byte holds the value for PlanePick, indicating which of the planes can hold data needed for the font. Every ColorFont I have examined has the value $FF in this position. The next value, $00, is the PlaneOnOff, which must always be zero. Then we find a pointer to the ColorTable ($009A+$0020=$00BA), and the pointer to the CharData table, $00AA—the same location as that given for the regular TextFontStructure above, but with pointers to each of the bitplanes, to be filled with the correct addresses at load time.

The ColorFontColors structure begins exactly where it was expected, at 00BA. $0000 is the cfc_Reserved flag, which must always be zero; $0004 is the cfc_Count flag—four colors this time. $000000A2 is a pointer to the ColorTable, although this time it begins in the very next byte. The remainder is the ColorTable itself, packed in the standard RGB format.

Table Settings

Below these structures, there is the CharData table, which describes every pixel on every bitmap to the system. On any given bitmap, a pixel can be turned on or turned off; all of the bitmaps together, laid one atop the other, make up the entire image. In a ColorFont, as in other graphics, you can have up to four bitplanes for 16-color fonts, and each pixel of each bitplane must be described in this table. A ColorFont can easily take up 50 or more kilobytes of memory!

In addition to the bitplanes, we must describe the location of the data for each character (the CharLoc table), the number of pixels to put between the characters (the CharSpace table) and the number of pixels to skip before beginning to draw the character (the CharKern table). The computer must read each of those tables before drawing any character on the screen, getting each of these bits of data and combining them to make the letters.

Colorfonts are likely to be very large, very wide, proportional, and appealing to users. Programmers must allow their programs to accept these fonts by reading the font attributes from the rastport, rather than simply assuming an eight-pixel, fixed-width font. Just a little more care by the programmer makes the Amiga far more fun for the user. ■

Betty Clay, a sysop on CompuServe's Amiga Forum (76702,337), writes for several Amiga publications. Write to her at 1605 Glasgow Dr., Arlington, TX 76015.

THE GAME PRESERVE

688 Attack Sub

By Kevin C. Rohrer

YOUR SUBMARINE GLIDES silently through the depths. You listen and hope that it is quieter than its enemy counterpart. The sub's towed array is deployed, and the forward tubes are filled with deadly, high-speed torpedoes.

A realistic simulator played in real time, 688 Attack Sub casts you as captain of an American Los Angeles or Russian Alfa class nuclear attack submarine on ten missions against the clock and the computer-controlled enemy. Using a combination of the mouse and keyboard, you control your sub via eight screen displays, including Sonar and Weapons Control. On the Ship's Control screen, you set the course, speed, and depth, ever mindful of the turbulence created by your propeller.



Listen for the enemy.

The Navigation Board has an auto-pilot that lets you plot courses by setting waypoints for the submarine to steer towards, thus freeing you for target location and destruction. While the zoomable top-down map shows your position along with possible targets, launched weapons, and the ocean's depth, a separate contour-imaging map helps you maneuver through undersea canyons.

For American commanders, missions range from sinking three derelict destroyers while remaining hidden from a friendly sub, to escorting a convoy or searching for and sinking a Soviet missile submarine. Alfa commanders take an opposite role in most missions: shadowing an American sub or finding and sinking one before its mission can be completed. Both sides have plenty of weapons: Harpoon, Tomahawk, and Sea Lance missiles, torpedoes, and noisemakers.

The detailed graphics are excellent, as are the digitized sounds. Unfortunately, the game pauses at sounds and hesitates when moving from one display to another.

688 Attack Sub is currently the best Amiga submarine simulator available. *($49.95, Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. No special requirements.)*

The Legend of William Tell

By Rob Lawrence

IN SWISS FOLKLORE, William Tell was a hero in the struggle against Austrian rule in the 14th century. According to Electronic Zoo, he is the hero of a new graphic adventure.

As the legendary crossbow archer Tell, you must battle your way across the canton of ►

Crib Notes

By Peter Olafson

• A NUMBER OF PEOPLE are having trouble in Throtl in *Champions of Krynn* ($49.95, Strategic Simulations). Here come the old adventure-game maxims: Map it. Walk over every square, and keep your "search" function on. Note every description; you never know what could be important.

Now you're seeing the shape of things, and provided you've been thorough, you should know where the temple is and how to get inside. There's only one logical place for the cleric to warm his toes.

If you're sent back to Throtl when you report to the commandant at the outpost, you haven't seen everything. The catacombs downstairs are sizable, and the way should be open once you clear the temple.

If you're having combat trouble, my favorite technique is to use the Hold Person spell against the enemy spellcasters—it's pretty effective against lower-level humanoids—and then use ranged weapons to take them out.

• The opening sequence in *Space Ace* ($59.95, ReadySoft) is a killer, with old SA on the receiving end. To leave Borf with egg on his nasty face: Go right, then left, then down.

• The key to *Space Harrier* ($49.95, Mindscape) is just staying in motion—from corner to corner to corner—while keeping up a barrage of fire. The monsters won't ever "lead" you with their own fire. (Arcade monsters almost never do. Where would we be if the monsters were as smart as we are?) They'll simply shoot at where you were when they fired.

• Patience is useful in *Sword of Aragon* ($49.95, Strategic Simulations), ►

DESK TOP STUFFING.



Konami is cooking now, with a hot computer game that gives you complete control of world championship caliber basketball, featuring Chicago, New York, Boston and LA.

From the opening tip, it's 5 on 5, full court, board crashing action, highlighted by blocks, steals, picks,



foul shots, 3 point bombs and 3 kinds of slams—the Gorilla, the Rim Rockin' Reverse and the In-Your-Face Jam!

Two can play at this game, or you can challenge the computer. Either way, it'll take all the runnin' and gunnin' you can muster if you hope to savor the taste of victory.

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Double Dribble is available for IBM. Also Commodore and Amiga in early 1990.

Circle 25 on Reader Service card.



Uri to reach the castle of Gessler, the tyrannical Austrian bailiff who has captured your only son. You'll explore 140 scenes of countryside (but only along the paths, not in the backgrounds) and interact with other characters through a detailed icon interface.

Everything in your view is displayed on the screen, and the large map with printed boundaries supplied with the hint-filled, 28-page manual helps you get your bearings. (The Wart Hog's Cave, however, is improperly placed on the map. Its correct location is one space to the left.) The animation is fast, the stereo sound effects are crisp and clear, and the intricate graphics are vividly colored.

William Tell is the type of game that keeps you searching and experimenting until, just as you're about to give up, you stumble across a new area to explore. As you travel, you'll find keys, treasures, special papers, shields, hand weapons, various crossbows and arrows, plus crossbow accessories. To keep up your health, you must frequently obtain food and drink. Your



Point and click your way through the 14th century.

strength won't suffer, however; there is no limit to the load you can carry, except for arrows (depending on the capacity of your quiver).

As you progress, you may need to confront villagers, monks, or knights, but be prepared: These people react instinctively to your actions. If you show your weapon, be ready to fight. A starving peasant once approached me and began begging for food, so I quickly devoured what I had left in hopes that he would leave. Instead, he became furious and attacked me. Some people are quite edgy.

The game is heavily copy protected; you can save only one game at a time, and you can't save high scores, but these limitations don't begin to outweigh the game's more eye-catching qualities. If you are an aficionado of arcade adventures and have a few afternoons to spare, buy The Legend of William Tell! *($39.95, Electronic Zoo, 3431-A Benson Ave., Baltimore, MD 21227, 301/646-5031. No special requirements.)*

FUTURE WARS

By Peter Olafson

FINE FRENCH IMPORTS are more than wine, cheese, and mineral water these days. Interplay has brought over Delphine's Future Wars, which attempts to up the stakes for Amiga animated graphic adventures. For the most part, it succeeds with a bang.

The story isn't one of the high points: A window washer from the present travels back to the Middle Ages and forward to the usual burned-out future to foil the usual sinister alien plot. It's all carried off, however, in such high fashion—from the striking graphics to a transparent interface—that you can't help but enjoy yourself.

The game's roots are clear enough: The linear structure and arcade interludes (a small shoot-'em-up sequence and a difficult timed maze) suggest the Sierra classics, but a distinctly delicate hand is at work here. The animated character's a slender little fellow. Many screens show a miniaturist's affection for detail and an oil painter's realism. Moreover, they aren't just pretty. The perspective is often striking and original, whether you're talking about the mirrored skyscraper at the outset, the shimmering reflection on a lake in the middle, or the spaceships toward the end. The ships are so vividly rendered that they don't seem like computer drawings.

Most agreeably, you don't have to type a thing. The command menu pops up in a dandy window in the nearest

too. The initial temptation is to expand south and in particular to Sur Nova, which appears ripe for the picking. It's true enough that, if handled correctly, that city will eventually turn into a boom town. At the start, however, it's a bad target. It's a little too ripe—they don't even put up a fight—and will prove prohibitively difficult to hold against raiding monsters or to develop at a time when you're building up your army. Your efforts are much better directed north toward Marinia, Brocada, Paritan, and Nuralia. Sur Nova will fall in due course, and by that time your advancing army will double as garrison.

If someone wants to be a vassal state or ally (I'm not saying who), don't, for heaven's sake, go attacking them. Vassals' donations to the kingdom will preserve you from the economy's seasonal fluctuations, while allies' troops can turn the tide in some of the nastier early battles.

• Holy overdue hints column! David Wachtman of Houston, TX, wants some tips on Level One of *Batman: The Movie* ($44.95, Data East). A couple of things will help you wing it, Dave. Don't use the batrope when you're facing bombers. Those guys are big trouble; take them out on sight. (Duck the bombs. Or, if you're below the bombers, hugging the wall closest to the bomber seems to keep you out of range.) The lovely little emissions from the pipes are regular as clockwork, and you can dodge them.

• Brian Downs of West Harrison, IN, is looking for the ant nest in *It Came from the Desert* ($49.95, Cinemaware). That's a tall order, Brian; the hole doesn't look special unless it's open, which only seems to happen when it's hot as hell or the ants are having a picnic. The nest is not a discrete, mouse-selectable location, either, so you'll need to be on foot or in a plane or tank. Actually, it's not even on the map; it's off the south edge near the southwest corner.

You'll need to visit Mine #1. From the center of the mine building, head south. You'll find two crescent-shaped rocks, the second of which will be right in front of you (about a screen from your starting point). From the

empty space upon a click of the mouse for easy access.

Eyesight, however, is often tested more than intellect here. Some of the objects you'll find or use are one- or two-pixel flyspecks that are difficult to manipulate or even to see. You really need to keep your eyes open for subtle color changes, as well. Save regularly so you can back up when you miss something. (Curiously, even when you play from a hard disk, the game saves to floppy.)

I liked the size change; in fact, I desired more of those obscure objects. (The game seems a little short on things to do.) In most animated adventures, the items you can take stand out a bit too much. In Future Wars, they blend right into the wallpaper and finding them is a whole new challenge. Not easy, but who said adventure gaming was easy? *($49.95, Interplay Productions, 1575 Corporate Dr., Costa Mesa, CA 92626, 714/549-2411. No special requirements.)*



You never know what will come in handy in the forest.

Space Rogue

By John Ryan

A SPACE FLIGHT simulation intertwined with a role-playing game, Space Rogue plays like a hybrid of Ultima and Elite.

You navigate your small Sunracer scout ship through the Far Arm Cluster in search of adventure and fame. To find it, you must promote income through trading or bounty hunting. If you survive enough encounters and space battles to garner income, you can upgrade your ship. Finally, you must talk to everyone you meet to generate missions on which you gather clues that help you unravel the mysteries needed to solve your quest.

In flight, you have a first-person perspective of your ship's cockpit, showing you your instruments and the stars. At-a-glance instrumentation includes speed, shield, tactical radar, and weapons data, but you can call up other navigational and ship's data screens. The graphics, however, are definitely IBM CGA derivatives and detract from the otherwise crisp display and the illusion of space flight.

In Space Rogue, reputation is everything, and it affects how other beings react to you. If you make a name for yourself as a fierce space warrior, for example, potential adversaries may decide to flee rather than chance an encounter. Likewise, the stances you take with the Imperium government and the Merchant's Guild will affect how these bodies interact with you.

As you navigate the Far Arm, you can visit mining colonies, space stations, outposts, and other waypoints. On these visits, the space simulation ends and the role-playing starts, switching to an overhead view. You can buy or sell goods, visit repair shops, and converse with the populace. As all possible actions are presented on the screen, you don't have to type a thing. In fact, I found controlling the game with a joystick easier than using the keyboard or mouse.

Password-protected and hard-drive-installable, Space Rogue is big, sophisticated, and a lot of fun to play. You will need many, many hours to complete it. I only wish the graphics matched the level of game play. *($49.95, Origin Systems, PO Box 161750, Austin, Texas, 78716, 512/328-0282. No special requirements.)* ►

shrubbery east of the rock, look south. You'll see a teardrop-shaped rock. Mentally draw a line linking these two points. Now, about a third of the way down this line, slightly to the east, is a tree. Southeast of the tree are two stones. From the larger of the two (the one farthest from the tree), mentally draw a second line, this one to the west. X marks the spot. If the ants are up and about, kill one as it emerges (a good marker for the future), and then make a break for the hole. Anything's better than these mental lines.

- The wolf blocking the way to the monastery in *Future Wars* ($49.95, Interplay) is making some people scratch their heads. Take the wool from over your eyes: Do you really think futuristic bad guys would use a regular old wolf as a watchdog? This boy wants a bath. Once inside, do as the other monks do. If you don't get the hint, just watch them for a bit. Otherwise, they'll be on you quicker than you can say, "See you next month."

If you need help with a game, you can reach me at 370 Central Park West, #109, New York, NY 10025, and by E-mail on GEnie as P.OLAFSON and on Plink as Peteroo.

COMPANIES MENTIONED:

Cinemaware, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171.

Data East USA Inc., 1850 Little Orchard St., San Jose, CA 95125, 408/286-7074.

Interplay Productions, 1575 Corporate Dr., Costa Mesa, CA 92626, 714/549-2411.

Mindscape, 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667.

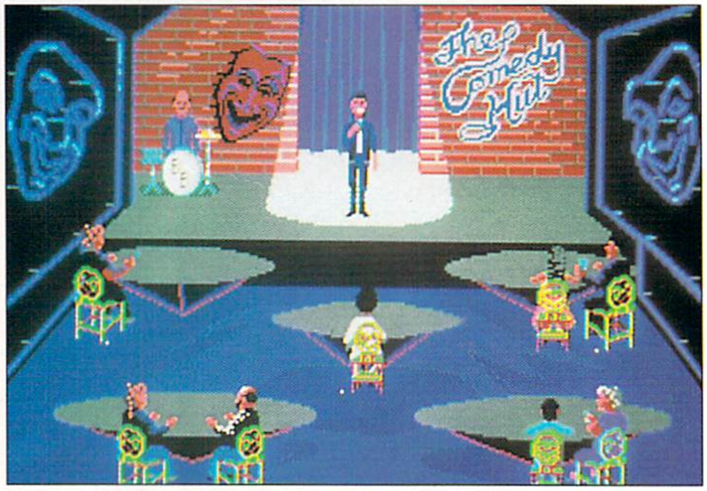
ReadySoft, 20 Wertheim Court, Unit #2, Richmond Hill, ONT, Canada L4B 1B9.

Strategic Simulations Inc., distributed by Electronic Arts. ■

Leisure Suit Larry III

By Peter Olafson

LARRY LAFFER GETS lucky again in Leisure Suit Larry III: Passionate Patty in the Pursuit of the Pulsating Pectorals, and, for the most part, so do we. As an animated adventure in general, it rates a



Sleazy clubs are Larry's specialty.

10. As an animated adventure for the Amiga, it's a solid 8.

We last left the paunchy, white-suited womanizer on Nontoonyt Island with the girl of his most recent dreams. As Larry III opens, she's left him for another woman, and the jilted husband lumbers into a jungle phone booth to emerge as the Leisure Suit Larry we know and ridicule. He embarks on a string of flings (none of them quite consummated and all funny) and eventually finds . . . still another girl of his dreams.

This time she's Passionate Patti, and her appearance midway in the action makes this the first Sierra game to feature more than one active character. Larry wanders off in a "no-more-women" huff over a misunderstanding, and Patti's got to find him. Unlike its predecessors, this game does not take control away from the player at a critical moment, and the parser, never Sierra's strong suit, seems more helpful than usual.

As a further departure, this is the first major-label Amiga game to include nudity and love-making (viewed from a semi-discreet distance or through a veil). Of course, it's sexist beyond telling, but it's executed with a light, deft touch. (Besides, the five-question quiz at the outset verifies the player's age and keeps out children.)

Leisure Suit III is a better conversion than most. The game's score and digitized sound effects, products of Sierra's new Amiga interpreter, are mostly terrific and add immensely to the game's flavor. The graphics seem only marginally better, however, as they are still based on IBM's undemanding EGA standard and are markedly slow.

You can speed up the ani-

mation a bit, but with more than one animated object on screen, the option is effectively disabled. Slowing things even earlier in the game are credits that don't stop when they should, an optional but still annoying autosave feature, and prodding messages from designer Al Lowe if you don't play fast enough. *($59.95, Sierra On-Line, PO Box 485, Coarsegold, CA 93614, 209/683-4468. No special requirements.)*

RINGS OF MEDUSA

By Patrick Quaid

YOU ARE CIRION, Crown Prince of Morenor, but your dad (the king) just lost the kingdom to someone called Medusa. To defeat her and reclaim the kingdom, you must find five rings scattered across the country by one of her former foes. The rings allow you to summon your enemy to a fight, and they give Rings of Medusa its name.

If this all sounds familiar, it is. Your objectives are traditional adventure game fare: Roam the country collecting treasure, power, and, with luck, a few rings; then take on Medusa for the keys to the castle. To keep things interesting, Rings of Medusa adds a few inventive twists to the usual formula. For example, you need money not only to hire soldiers, but also to meet the monthly payroll (if you fall short, the computer crashes). You can hire people of ten different races into seven military units, and then organize the soldiers according to their racial abilities and the demands of the unit type. To get the money for all this, you can gamble, take out a loan, waylay caravans, and attack ships and cities from land or sea. You can even go into the mining business.

On screen, your little army is an icon similar to a chess pawn, which you lead around a nicely rendered map. The game is almost entirely mouse driven, and although the interface is not intuitive, you do get used to it with practice. Don't expect to rely heavily on the meager manual; it is handicapped by a poor translation from German.

Rings of Medusa has few of the careful touches that separate the good games from the mediocre. In fact, several glaring errors point out how little effort went into everything outside of the basic design. Although the game is set in a heroic age of swords and dragons, the title screen shows Napoleonic troops carrying muskets. Also, the author of the manual can never decide just what Medusa is; she is called everything from a demon to a goddess.

Rings of Medusa could have been a very good game if it had been polished before release. You could probably learn to overlook its faults and enjoy its clever design, but Amiga gamers expect, and deserve, more for their money these days. *($49.95, Starbyte Software, distributed by Star Games, 708 W. Buffalo Ave., Suite 200, Tampa, FL 33603, 813/933-8023. No special requirements.)* ■

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precious little concrete instruction. I may be able to match squares representing a supernova, and hear the Amiga tell me it is a supernova, but this brings me no nearer to knowing what a supernova is, and, as long as I can win without knowing, I am not likely to care.

WANT TO LEARN THE KEYBOARD, SCARECROW?

The author of **PETE** (Programmable Electronic Teaching Equipment) knows exactly what he is trying to teach, and has designed the program both to reinforce letter and number recognition and to enable children to learn about the computer keyboard. Its operation is simple, and the graphics are crisp.

PETE presents you with a screen image of the Amiga keyboard. When a child presses a key on the actual keyboard, or clicks on its image with the mouse, PETE reacts. Press the "a" key and a picture of an apple appears next to a letter A, while the computer calls out, "This is a capital 'A'. This is an apple. Apple begins with the letter A." The same pattern repeats for each key. That's all there is to it.

The graphics are well done, the program is friendly, and the author has



Letters and numbers are "key" in PETE.

massaged the Amiga's voice to the point where you can understand it. But frankly, my children already know the computer keyboard from using paint programs, games, and other applications where there exists motivation to learn. PETE does his job. But once through, PETE will remain a curiosity on your software shelf.

NOW I KNOW WE'RE NOT IN KANSAS, TOTO!

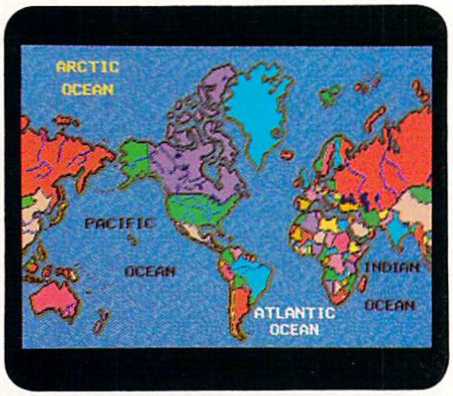
"Dad! I used to be in second place, now Adria's in second place and you're in fourth!"

When such cries come from a child seated at a computer, and the software running is "educational," the product is worthy of a close look. **World Odyssey**, being such a program, has taken us a step closer to Oz. Of the programs reviewed thus far, this one is the most honest in its packaging and claims, and the most innovative in its approach.

World Odyssey contains 12 maps of various parts of the world. Select a map, and it shatters into a 20-piece puzzle. Making creative use of the two blank pieces, you must shuffle the map into perspective by sliding pieces like a tile game. Each time you slide a piece into its proper location, you must answer some questions about the countries or states attached to that piece. Normally, this involves naming the country, state,

or capital. Be clever and quick in your reconstruction, and your efforts are remembered in the top ten for that puzzle.

We have found that World Odyssey



You can change the world!

reinforces geographic knowledge in a creative and challenging way. What sets it apart is its flexibility. The questions asked, even the maps displayed, can all be altered. Thus, when California finally slides into the sea, simply load the appropriate map into your paint program and erase the state. And as soon as East and West Germany reunite, make the necessary modifications, and your program will be up to date.

I am disturbed that the program spells Chile "Chili" and calls the USSR "Russia." I also believe that the producers should provide a more balanced projection of the world—one that does not split Asia in two. But apart from these quibbles (all of which you can modify), World Odyssey is worthwhile.

Back to Kansas

Math Odyssey is built upon the same principles as World Odyssey. It asks the child to answer some arithmetic problems, and reveals pieces of a puzzle and as he does so. Once all problems have been answered, the child can assemble the puzzle. As with World Odyssey, the problems, the level of difficulty (from simple addition to division), and the pictures used for the puzzles, can all be modified.

In World Odyssey, assembling a map is directly related to knowledge about the relationship between countries. In Math Odyssey, however, the questions and the activity of assembling the puzzle have no relationship. What works well for a geography lesson falls short in arithmetic. Math Odyssey fails even as a tool for drilling math facts. I would rather stick to flash cards.

How Can You Talk if You Don't Have a Brain?

The Talking Animator 2.0 is an orange in a crate of apples. While the programs discussed thus far are designed to teach a child academic concepts, The Talking Animator is a child-size version of a standard Amiga application. It does not depend on drill and repetition to teach, but rather makes a complex procedure accessible to the youngest of children. Much of educational software squelches creativity, but The Talking Animator stimulates children to sit before a computer and exercise creative impulses. It is a joy to commend.

Animation achieved by flipping pages in rapid succession is a concept children readily understand. The Talking Anima-

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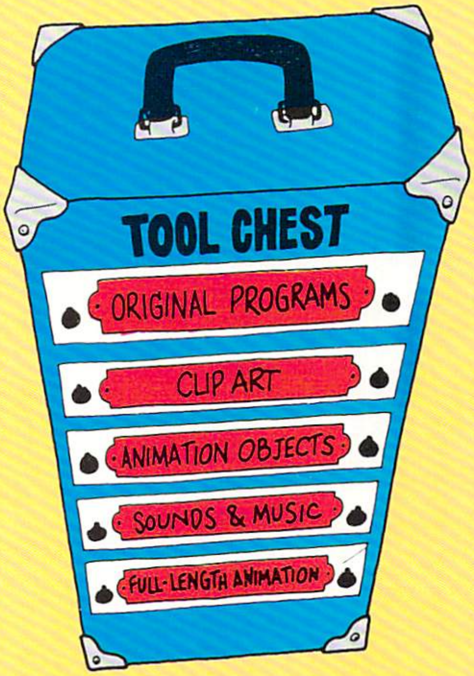
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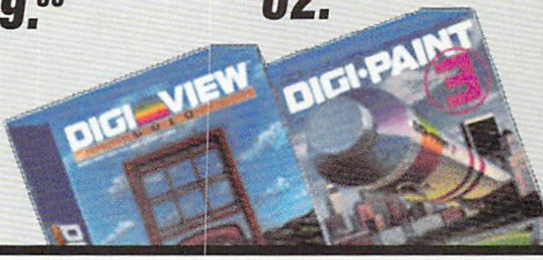
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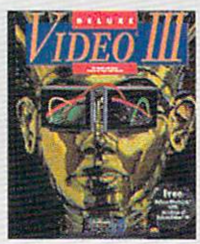
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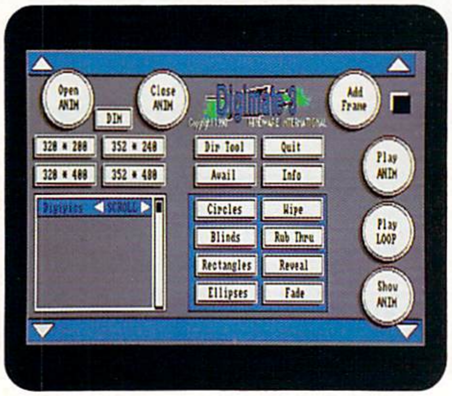
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From p. 67

tor adopts this concept and encourages the child to create separate visuals that the computer then flips for the animated effect. The program provides all the necessary drawing and manipulation tools, but if you prefer, you can import IFF files for use as images and backgrounds. It is simple to use (easy enough for my youngest son, who cannot yet read), and yet the program has enough features to make it functional. It offers vocal help for those who cannot read. You can also add speech to animations, but the speech synthesizer stops the flipping of pages, so you must use speech carefully.



Talking Animator stimulates creativity.

Though the resulting animations are a bit jerky, they are nonetheless good enough to please the budding animator. The program would benefit from an expanded manual and, perhaps, a voice-guided tutorial. But as a parent who sometimes worries that the longer my child spends in front of the computer, the more his brain will resemble cottage cheese, I am pleased by software such as this that exercises creativity and encourages him to pursue his interests.

OH, MAGNIFICENT OZ. . .

. . .What do I wish for in Amiga educational software? I wish for more applications designed for children—word processing and desktop publishing, for a start—along the lines of Talking Animator. I would also like to see programs that exercise and combine the Amiga's animation, sound, and graphics capabilities to actually teach—and not just drill—a subject such as music theory. As the market now stands, there exists far more for us to avoid than to buy.

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DigiMate III

Shell we animate Digi-Paint files?

By Joel Hagen

LAST YEAR SAW the release of the first two Amiga paint programs with animation capabilities. Electronic Arts' DeluxePaint III offers powerful and extensive animation features, while Photon Paint 2 (MicroIllusions) provides more rudimentary functions for animating HAM files. Now, with DigiMate III, Mindware International gives users of NewTek's Digi-Paint 3 a multitasking animation companion. DigiMate provides animation capabilities that fall somewhere between those of DeluxePaint and Photon Paint, plus some handy tools for processing standard ANIM-format animation files outside of Digi-Paint 3.

DigiMate requires one meg of RAM, Amiga 1.3 or higher, and ARexx, the interprocess-control protocol that is part of AmigaDOS 2.0, but also available separately from William Hawes. DigiMate comes on a nonbootable disk, but an icon on the main screen lets you create a bootable version containing all necessary DigiMate, AmigaDOS, and ARexx files. Another icon similarly installs the program on a hard drive.

For most operations, DigiMate runs from Workbench as a multitasking interface to Digi-Paint. Its screen can be raised or lowered to reveal half of the Digi-Paint screen, and front and back gadgets allow you to move between the two programs. DigiMate lets you build an ANIM-standard animation one frame at a time by painting or rearranging each one using Digi-Paint tools. With the completion of each frame, the program automatically compresses it into the ANIM file.

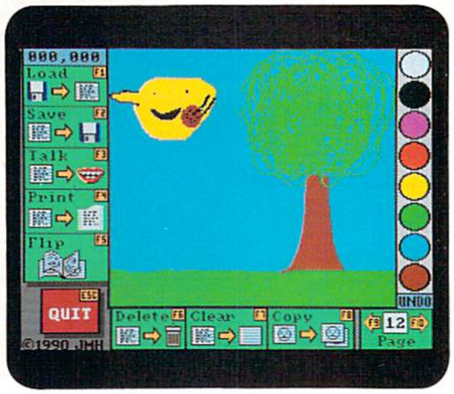
Unfortunately, DigiMate offers none of the dynamic animation tools found in DeluxePaint III: For example, it cannot automatically animate a brush across space, or spin, zoom, or warp a brush. Instead, it requires you to finish every aspect of each frame by hand. I can do this kind of HAM animation with the public-domain program MakeAnim and ►

a list of IFF files; DigiMate is more convenient, but not more powerful.

Adjusting and Linking

DigiMate contains a library of eight effects, including Circles, Wipe, and Fade, that automatically build an ANIM of the transition between two images (although I am unclear as to the value of such an animation). You can add or delete frames, or process entire ANIMs in a number of ways: changing HAM to other resolutions, reducing the screen size or expanding it to overscan, reducing color to black and white, or performing edge detection. DigiMate can play ANIMs not only from RAM, but also directly from a hard or floppy drive (playback from floppy is inherently slow).

Through ARexx, one application can control aspects of other applications, and in the case of DigiMate, ARexx provides a control link to Digi-Paint. DigiMate also uses Mindware's T.A.S.S. application-support system—an interface to the interprogram communication. Thankfully, Mindware has done a good job of keeping ARexx and T.A.S.S. transparent. You don't have to understand a thing about either to use DigiMate, but with them, you can customize DigiMate to better suit your own ideas and needs. They constitute a powerful option.



Raise or lower this screen to reveal Digi-Paint.

The 52-page DigiMate manual includes easy-to-follow tutorials for just about every feature of the program, which is straightforward and simple to use. Following the examples, you can quickly learn to make and play a HAM animation, generate transitions, or process an ANIM. The on-line help feature lets you position the pointer over any button or window on the screen and press the Help key to summon a screen full of valuable information about that item. Unfortunately, however, this feature is not fully implemented on the bootable-disk version.

An Imperfect Mate

I found some annoying bugs in DigiMate. For example, pressing the CRTL-C key combination does abort a looping ANIM, as stated in the manual, but if you inadvertently press a mouse button while the ANIM is playing, the system freezes up, and there is no way out but to reboot all four programs: Workbench, DigiMate, ARexx, and Digi-Paint. Also, a ReadMe file on disk warns that without a meg of chip RAM, running DigiMate and Digi-Paint simultaneously in other than lo-res can cause a crash. To help solve this, Mindware provides a second version of the DigiMate interface, which runs from a ►

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YOUR TURN!

DigiMate III is a much-needed product. It's the only thing I know of that can animate Digi-Paint files, and that's important because HAM animation is where it's at. The animation processing is terrific. The program needs to be more automatic, however. As it is, you must lay down every frame yourself, although I understand that an upgrade is planned to do tweening. I'm happy with Mindware's support, too. The company seems interested in how users feel about the product.

Ray Mlynczak
Elkins Park, PA

small, memory-conserving window. This Tiny DigiMate is not covered in the manual, but is well documented in a file on disk. A ReadMe file recommends that you use Tiny DigiMate whenever possible unless you need the ANIM-processing features not found in it.

Among telltale signs that this product was rushed out the door before it was finished is the fact that the DigiMate screen pictured on the box does not resemble the screen in either the disk or the manual. As another example, the manual promises a more sophisticated version of the mediocre edge-detection feature in the future. In testing DigiMate, I had the feeling I was using interesting but klugey beta software.

DigiMate III gives Digi-Paint users a basic animation builder with some interesting options and extras. I think Mindware is on a good track, and I applaud the company for supporting ARexx and a philosophy of integrated applications. If you are not in a hurry for HAM animation tools, however, I suggest you wait for a more sophisticated and better-tested version.

DigiMate III
Mindware International
110 Dunlop St. W.
Barrie, Ont., Canada L4M 5R3
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One megabyte and ARexx required.

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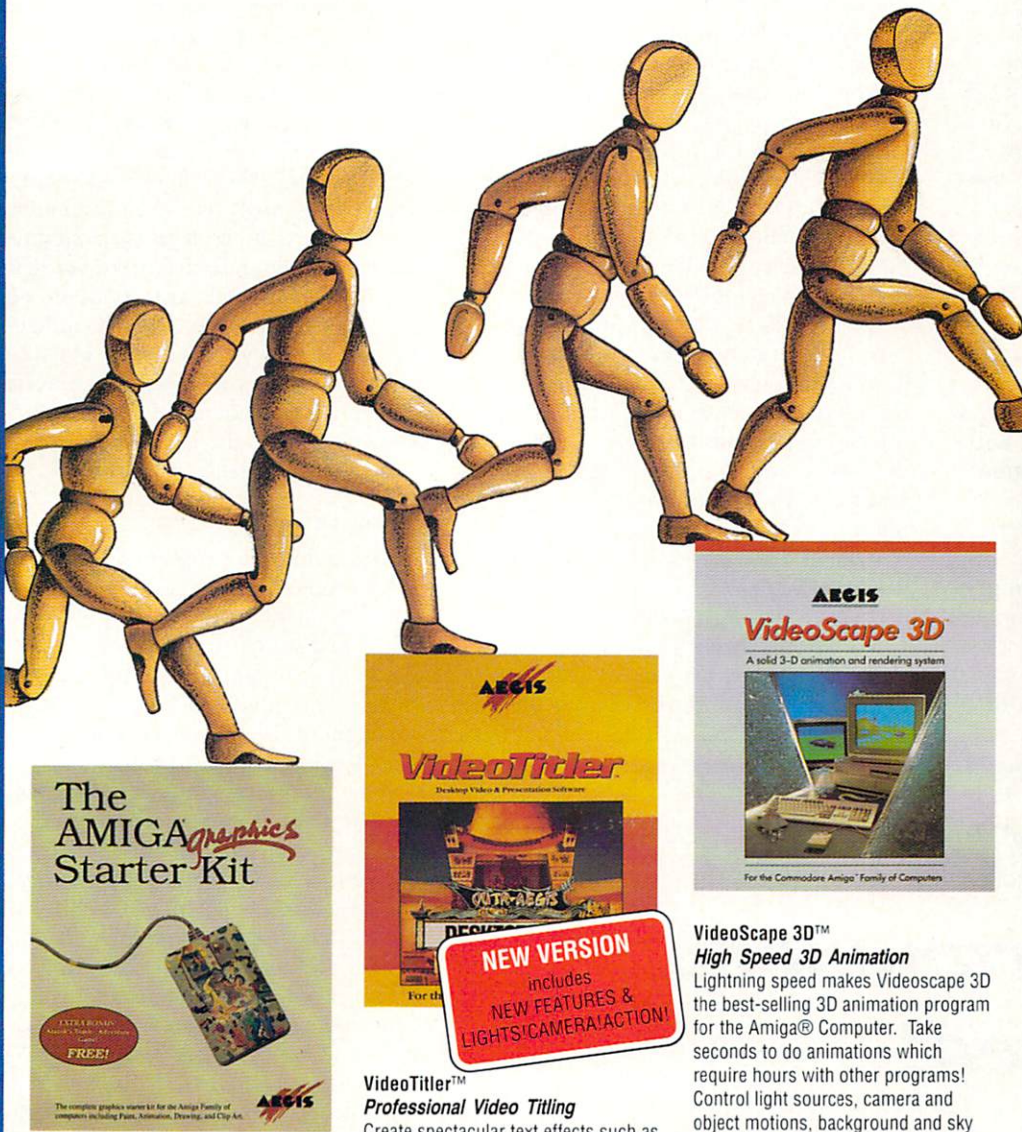
By Neil Randall

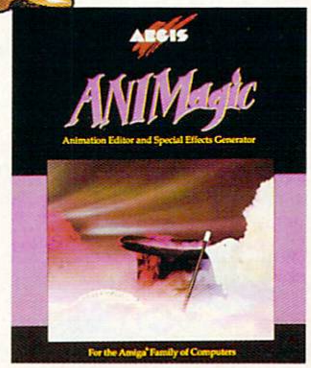
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this is an extremely easy-to-use package, and for teachers it could prove indispensable.

Call the Class to Order

Anticipating that teachers may not be Workbench aficionados, Integral Software made EZ-Grade self-booting. The single disk is noncopy-protected, however, so duplicating or installing the program on a hard drive is easy. Once the program has booted, it asks you to choose a class list from the file selector. This is one of the few places where first-time users could become frustrated: There is no indication here of how to start your own list (a button labelled "Start new class list" would be helpful). A sample list is on the EZ-Grade disk, but it is actually easier to learn the program by starting from scratch.

Entering a class roster is easy. First, you cancel the class-list selector and choose New Class from the File menu. Give the course an identification number (the manual suggests using the period during which the class meets), type in a title (e.g., English 251), then follow the prompts to type the last and first name of each student. EZ-Grade also gives you the option of including the grade level for each student. Because many schools now group students of different grade levels in the same class, this option can produce very useful data.

Your next step is to decide what kinds of assignments you will be grading, and how much each is worth (i.e., its "weight"). Here, EZ-Grade is flexibile. The disk includes several assignment types (homework, laboratory, and so on), but you can change any or all of these, and have different ones for each class. When allocating weights, it is best to have a different assignment type for each separate weight. For instance, you can assign laboratory work to be 50% of the total grade, and the program will add up all the laboratory-type assignments and weight them accordingly. But if three of those lab assignments are worth 30% of the grade, while the rest are worth 20%, you are better off having two different categories of assignments, calling them, say, Lab1 and Lab2.

EZ-Grade also includes options for entering data about the students themselves. You can include a couple of comment lines about each student, and phone numbers as well. A password system lets you keep inquisitive students, principals, and department heads from sifting through your files.

Entering grades is easy and, once again, flexible. Select New Grade from the File menu, then click on the appropriate assignment type. You can enter a line of information about the assignment (an extremely useful feature if you have several assignments), and choose to enter grades either in order (usually alphabetical) or randomly (by selecting individual students). After you've finished entering grades for all students in the class, EZ-Grade performs its calculations and returns you to the class-list screen.

Look Report

At this point, the program takes off. With even one set of grades entered, you can request statistics and graphs about individual students or the entire class. Click on a student name, and you get a history of that student's performance throughout the course. From here, you can alter grades if you wish.

Even more impressive are the means by which you can examine the grades you have entered. The View menu offers six ways of doing this. First are two simple screens showing your class list with the students' letter grades or percentages to date. Next is a histogram, with a bar chart showing how many students have achieved each grade scale (A's, B+'s, etc.—you can alter this scale to suit your institution's standards). This chart demonstrates, perhaps more quickly than you wish, your grading biases. More colorful still is the Class Data option, which yields a pie chart showing letter-grade breakdown, another showing grade composition, a bar chart recording absences, and a line graph displaying the class history across the number of grades recorded.

The Grades menu lets you set grade categories and weights. It also lets you curve one or more grades, which is particularly useful if you want to experiment with the implications of raising or lowering a specific grade. From here you can also drop low scores, if that is your preferred method of balancing grades.

The Print menu offers another host of ►



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options. You can print blank grade sheets to keep at your desk, and comment and phone lists, too. You can also print gradebook pages, on which you can sort grades in different ways. A printed class summary includes absent days, grade level, and the grades themselves, while printed grade summaries give information about specific assignments. Finally, EZ-Grade allows a printout of a complete progress report for your class, and lets you set up and define as many as ten comment areas.

If I were a principal or department head of a school that had access to Amigas (or if I could buy some), I would insist that my teachers make full use of EZ-Grade. Apart from the fact that EZ-Grade lets educators keep detailed records of any number of classes, the program makes them look at their grading practices and biases. Dedicated teachers will want to know this information; those less dedicated should be forced to look at it. EZ-Grade has a few interface difficulties, and its manual is unspecific about several commands and reports, but the program itself is highly useful and easy to operate. If you are a teacher, you should take a look at it.

EZ-Grade
Integral Software
2721 Embassy Row
Indianapolis, IN 46224
317/297-7369
$59.95
One megabyte required.

THE ART DEPARTMENT

24-bit processing power

By Mitch Wells

THE ART DEPARTMENT is an image-processing program that, unlike other similar Amiga software, processes 24-bit color and 8-bit gray-scale images. The Art Department (dubbed TAD by developer ASDG) works directly with IFF images containing 1 to 24 bits of color (including those in Sliced-HAM, A-HAM, A-Res, and ASDG's own 24-bit IFF formats). With the help of loader programs that ASDG sells separately at various prices, the program also accepts 8-, 21-, and 24-bit files such as those created with Digi-View (NewTek), Sculpt-Animate 4D (Byte by Byte), Turbo Silver (Impulse), Caligari Rendition (Octree), the MS-DOS version of DeluxePaint II (Electronic Arts), and other products, plus GIF- and TIFF-format files.

A main function of the noncopy-protected TAD is to give you complete control over how these various images are displayed on screen. One way it does this is by storing the picture information in 24-bit format—regardless of how many bits are in the original. Then, when you perform scaling, it reinterprets the picture and renders it again, giving you results that are amazingly free of jagged edges. TAD's dithering technology (there are six dithering modes) can make a 16-color image appear to have hundreds of colors. This is a boon for animators who must trim 24-bit or HAM images down to fewer colors to achieve a smooth flow.

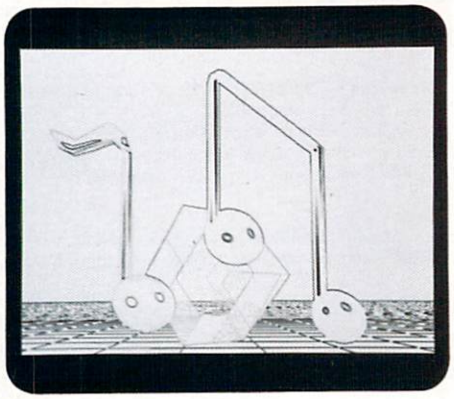
Palette-control features include palette matching between pictures and selection of the number of colors that make up an image. TAD can also alter a picture's orientation and color balance (brightness and contrast). These features, combined with TAD's link to MicroIllusion's Transport Controller and support of A-Res (4096 colors in hi-res) and A-HAM (4096 colors without fringing) modes, make TAD an inexpensive alternative to external frame buffers. TAD's rendering engine interprets and optimizes 24-bit data according to your specifications (such as screen size, number of colors, and dithering type) to produce results that are, in theory, the best possible within those parameters.

I compared HAM images created with Sculpt-Animate 4D, Turbo Silver, and Impulse's VD-1 digitizer with the same image files saved in 12- and 24-bit formats rendered in TAD's A-HAM mode, and found the TAD images noticeably cleaner and crisper. In some cases, TAD graphics even compare favorably to the 24-bit images displayed on a frame buffer. TAD cannot replace a frame buffer, but can be helpful for single-frame recording.

HOT ON THE PRESSES

Three further TAD functions are geared toward desktop publishing: the abilities to do professional color separations, to ►

convert color art to hi-res gray scale, and to create line art with up to 16 colors from a gray-scale image.

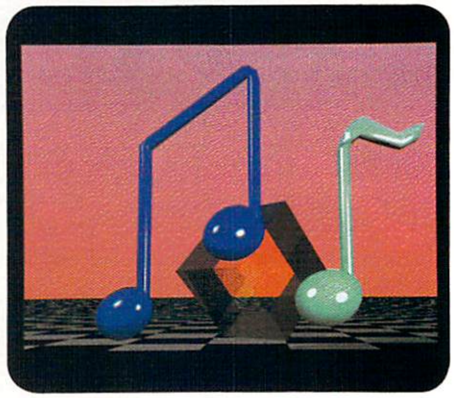


A Sculpt 4D 24-bit file. . .

The Amiga has received acclaim because some of its PostScript-compatible Amiga programs, most notably Gold Disk's Professional Page and Soft-Logik's PageStream, can color-separate all elements in a layout, including HAM and Encapsulated PostScript art. Although HAM separations are often of low quality color and resolution, until now they were the best way to work with digitizations and bitmaps. With TAD, however, you can color-separate any 24-bit image—whether scanned, digitized, rendered with 3-D software, or created with a Targa board—and, using ASDG's ReSep software, integrate it into the PostScript code of a Pro Page document. You can then print the separations with a PostScript printer, saving hundreds of dollars in professional color-separation costs.

Regardless of what format it is in, when you load a color image that contains nonequal RGB or nonwhite/gray/black values, TAD converts the image internally to 24 bits. If the image has only equal RGB or white/gray/black values, TAD converts it to 8-bit/256 gray-scale, (a standard among desktop publishers in the Mac and PC worlds that has no true implementation in the Amiga marketplace, where 2- to 16-color hi-res IFF images are the norm). Fortunately, TAD does great 24-bit color to 8-bit gray-scale conversions. TAD's line-art function converts color images to line art using 2 to 16 shades of gray with beautiful, sometimes astounding results. Some images that I converted appear hand-drawn, almost charcoal-like. When you factor in the dithering control, this is probably the best implementation of line-art conversion that exists for the Amiga.

TAD also offers rendering in up to 208 Amiga video modes (including PAL) and the fetching of current Workbench colors for icon creation. The Remove Isolated Pixels function automatically touches up nonHAM digitized images. It examines each pixel, and if it finds one surrounded by eight pixels of another color, it changes that center pixel to match the other eight.



. . .reduced to line art.

A TAD SHY OF GREATNESS

In A-HAM, perhaps its best display mode, TAD unfortunately offers no access to the Transport Controller function. This is probably because A-HAM requires extreme processor overhead, but it is disappointing, nonetheless. A-Res mode, too, lacks Transport Controller support. Also like A-HAM, A-Res creates a separate 16-color palette for every video line, and while some conversions it produces look well, large white areas come out multicolored. TAD's interface is smart and pleasant to look at, ►



The Art Department's interface is exceptional, and its features are far better than those of programs like PIXmate and Transfer 24. Rescaling is very good, for instance, and it supports 24-bit graphics. You do not have to read the manual to use the program, but when you need it for reference, the index makes things easy to find. If you have a scanner or digitizer, you will appreciate this program: It will tell you what percentage it needs to shrink a digitized image to display it on screen, and it does a very good job of reduction. The Art Department's variety of dithering options is excellent, although Transfer 24's 4096+ mode creates a better transition between colors when converting HAM images to fewer bit-planes. My only complaint about The Art Department is that not all operations can be undone.

Jeff Bruette
Wilmington, DE

except for the file requesters, which provide almost too much information: I would prefer automatic alphabetizing of file names and directories.

My complaints are minor, however. The Art Department is one of the most useful programs to come along for video and desktop-publishing professionals in quite some time.

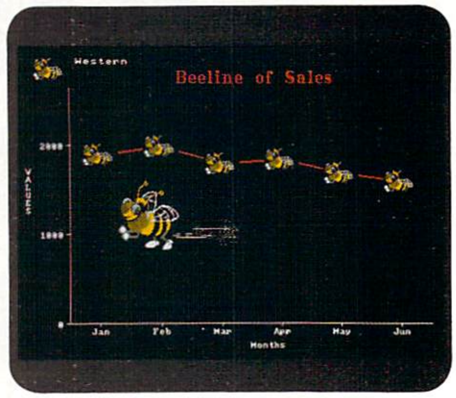
The Art Department
ASDG
925 Stewart St.
Madison, WI 53713
608/273-6585
$89.95
One megabyte required.

BGraphics

Graph biz

By Geoffrey Williams

AMIGA GRAPH-MAKING programs have been pretty much limited to those included in spreadsheet packages. Now, Brown-Wagh has released BGraphics, a dedicated business-graphics program that can create over 20 types of charts from your data. It certainly has more capabilities than spreadsheet packages, but



What puts the bee in business?

the real question is whether these features are strong enough.

There are two ways to get data into BGraphics. You can either type it directly into a spreadsheet-like screen, or, if you can save it in ASCII format, import it from a spreadsheet. Because ►

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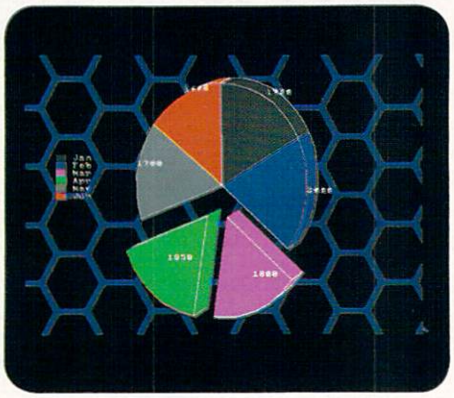
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BGraphics does not accept data in standard spreadsheet formats such as Lotus 1-2-3, or in any Amiga spreadsheet formats, in most cases you will wind up typing it in.

Once it is in BGraphics, you can transform your data into 2-D or 3-D pie, line, column, or bar charts. Pie charts can be hollow or filled, with either the value or the category (such as months) charted. Line charts can be in xy, xy area, scatter, or regression forms. Columns can be single, stacked, absolute (showing negative values), overlapping, or stepped (as a histogram). Bar charts can be single, stacked, absolute or overlapping.



Bee-line. . .pie?

You can scale a chart simply by sizing its window, and even combine two charts on one screen by sizing both to half their original widths. I also like the fact that you can create an exploded pie chart by clicking on the pie pieces and dragging them into position.

The quality of these charts is adequate, but the 3-D mode is disappointing. Edges are not shaded (even with a limited palette, this is easy to do by dithering two colors together), and you have no choice of perspective views.

You can put value labels on your chart, but the text is almost illegible because the labels display in the same color as the outlines of the chart and often overlap those lines. Both the labels and the outlines are assigned to the same position (color) on the palette, so there is no way around the problem.

A requester lets you control x and y axes, setting the minimum and maximum values and the intervals for the tick marks. You can also enter the number of decimal places and minor tick marks. The program displays graphs in linear or log scale, and values in integer, floating point, scientific, or dollar format. Tick marks can be placed inside or outside the axes.

BGraphics supports two resolutions, 640×200 and 640×400. It does not support overscan, however, a major failing for video applications. You can load IFF images, including HAM, as backgrounds, but BGraphics can display only the first 16 colors in either resolution. This level of graphics support is disappointing.

A Brush with Disaster

You can also load brushes, and because they are independent objects, you can move them around at any time without disturbing the background or the chart. This feature is wonderful, except for the fact it does not make color 0 transparent. This means that the background part of your brush, which should be invisible, is not, so it obscures the chart and the chart's background. This is an appalling problem, which makes the use of brushes nearly pointless unless you use no background or carefully position the brush away from the chart.

You can also use a brush to make a bar or line chart, although the manual fails to point out that brush size is very limited for this purpose. After repeated flashing of the "Brush too big" message, I figured out that they must be less than 40 pixels wide and 30 pixels tall. Here again, you have the color 0 problem, so you cannot effectively place a brush over a background. While the ability to paste a brush over other things would be handy, it is also not difficult to do with DeluxePaint (Electronic Arts).

Drummer Different

One of the major failings of this program is the non-standard way it handles so many things. To select a color palette, for example, you must load a picture from the Palette menu. But doing this loads only the color information; you must then load the picture as an IFF-Brush, IFFChartBrush, or IFFBackDrop. Why is there no simple option to let you choose the picture's color information when you load it?

Requesters are also confusing, making the program that much harder to use. Whether you select Load or Save from ►

the program's pull-down menu, you get the same requester, with a Load button on the right and a Save button on the left. The standard form is to have a single button (labeled Load or Save, depending on which action you choose), positioned in the same place on both requesters. Out of habit formed from using other software, I repeatedly wound up clicking the left button—Save—when trying to load graphics. This flashed a message saying I was not in the Save requester.

BGraphics saves pictures in a bizarre resolution: 616 × 365. To get it into the full standard 640 x 400 format, you must copy the image to the Transfer screen by clicking the T gadget and selecting No Borders from a pull-down menu.

Because graphs are usually printed in black and white, the ability to substitute patterns for colors is very important. Interfaces for creating patterns are pretty standard: Most programs let you draw dots in a small box and then display the box in a larger area as a repeating pattern. BGraphics provides instead a binary interface—a box filled with 8 rows of 16 numbers—zeroes and ones. Zeroes represent transparency, ones represent dots. To change the pattern, you must edit the numbers. This is inexcusable. Thankfully, the program provides several predefined patterns you can use.

The program lets you draw solid and broken lines and simple boxes, and the ability to draw lines with arrows at either or both ends is a nice feature, but poorly executed. When you draw an angled line, for example, the arrow stays horizontal, which looks awful. And when you change the thickness of the line, the arrowhead remains one pixel wide. Because there is no Undo feature, you must select Delete from a pull-down menu and draw a box around an item in order to get rid of it.

I have seen programs far worse than this greatly improved in revisions. I sincerely hope the author of BGraphics makes this program into a professional tool comparable to the better products on the IBM and Mac platforms. We really need a powerful tool for business graphics on the Amiga. Unfortunately, this is not it.

BGraphics 1.0
Brown-Wagh Publishing
130-D Knowles Dr.
Los Gatos, CA 95030
408/378-3838
800/451-0900
$195.
No special requirements.

PROWRITE 3.0

New features from the write side of the tracks.

By Loren Lovhaug

OVER THE YEARS, two fundamental types of Amiga word processors have evolved: graphics-based programs, which use screen fonts, integrate IFF graphics, and output to printers in bitmap form; and character-based types, which print in character form and do not support graphics. The main advantages of graphics-based word processors are near- ►

WYSIWYG (What You See Is What You Get) screen displays and graphics prowess. On the other hand, character-based programs are not only strong in text-entry and -editing speed and in accessing resident printer fonts, but they also include such robust features as multiple-column output, macros, odd- and even-page margin offsets, and thesaurus facilities. New Horizons' ProWrite is most certainly a graphics-oriented word processor, but the 3.0 upgrade includes many features traditionally associated only with character-based products.

COLUMN AS YOU SEE 'EM

New Horizons has added support for multiple-column text with two layout schemes. Both allow up to five columns per page. The first flows text from top to bottom in each column, starting at the left of the page and working toward the right. The other structure is useful for working with horizontally related items such as tables and theatrical scripts. In this mode, each time you type a carriage return, your cursor jumps to the next right column (or to the leftmost column if you are currently at the far right of the page). In either mode, you can specify the width and position of individual columns and change relative margins within the columns themselves.

YOUR TURN!

I think ProWrite 3.0 is great. I like the fact that you can print letter-quality text along with graphics. The output is very nice, even on my nine-pin printer. The thesaurus and spelling checker are fantastic, the program is fast, and it's never crashed on me! The only suggestion I can make is for a Dynamic HAM and Sliced HAM import facility; otherwise, ProWrite accepts almost all graphics formats—even HAM pictures.

—***John Evers***
Port Jefferson Station, NY

Another feature that had been the exclusive domain of character-based applications is support for resident printer fonts. ProWrite 2.5 introduced limited support for such fonts (NLQ mode), but as impressive as this was, it had serious limitations. Not only would the program print just one monospaced font per document, but discrepancies between screen fonts (even monospaced) and the fonts found in most dot-matrix printers virtually guaranteed that hard copy would not mimic the screen.

ProWrite 3.0 rectifies these problems by letting you mix up to six resident monospaced type sizes (depending on your printer) in a document. This provides Amiga screen fonts that better emulate most dot-matrix printer typefaces. Thus, if your printer supports monospaced 10-character-per-inch (cpi) pica, 12-cpi elite, 15- or 17-cpi condensed, 5-cpi expanded pica, 6-cpi expanded elite, or 7.5- or 8.5-cpi expanded condensed styles, you can mix these fonts in a document and see a good approximation of the print version on screen.

The screen display is not perfect, however: In tests with several printers, I found that only 10-cpi printed fonts always match the screen. Depending on line and word length, other fonts typically exhibit extra spacing between ►

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words. The print requester's optimal-spacing setting alleviates this problem, but does not cure it.

Other printing enhancements include an ability to scale output in 1% increments. This feature lets you enlarge a document to create banners and posters, or reduce it to improve its resolution or make it fit into small layouts. You can also adjust line spacing in single-point increments. Those who create newsletters, reports, or other bound documents will appreciate the adjustable margins, headers and footers for odd and even pages, and the ability to print in a variety of sequences, including back-to-front, separated odd and even, and collated.

A generous 300,000-word thesaurus now complements ProWrite's 100,000-word spelling checker, and a word-lookup function helps you correct badly misspelled words that the spelling checker cannot identify. A document-analysis feature calculates and reports the average word and sentence length, and the number of characters, words, lines, pages, sentences, paragraphs, and pictures.

Wholly Macro

A macro-programming facility has been added via an ARexx port and ARexx directives that match most ProWrite functions. Using these facilities, you can create ARexx scripts to automate ProWrite tasks, either from within the program itself or from external applications. You can execute macros from within ProWrite by using the Macro menu, which includes slots corresponding to function keys for ten macros, and another slot into which you can type filenames for other macro scripts.

While using ARexx to provide macro programming gives ProWrite enormous potential (particularly for intertask communication), there are some philosophical and practical drawbacks inherent in ProWrite's implementation of ARexx. First, you must own ARexx, which is not yet a part of Workbench, in order to create or use ProWrite macros. Also, you must know how to use ARexx and the ProWrite directives. This can be intimidating, particularly if you want only to create a simple macro.

A solution to both problems might be an easy-to-use feature for recording ProWrite operations, storing them in ARexx-script form, and playing them back without ARexx. This would make it easy for those lacking ARexx or those wanting to create macros in script form to use macros without sacrificing all the power of ARexx. As an added benefit, this feature would make an excellent script starter for those wanting to create more complex macros with ARexx.

Also plaguing the macro system is the fact that although macro directives are provided for most ProWrite functions, full automation is not always possible, because you cannot program these directives to set values and adjust gadgets. Say, for instance, that you need a macro to change margins and typefaces to set off a long quote. Because ProWrite employs requesters to set both margins and typefaces, and because the program does not include directives for setting these values externally, the best your macro can do is to call up the change-font and layout requesters. You must still set the values manually.

Although you can emulate this appli- ►

cation by using the Retain and Apply commands, which have macro directives (these let you store one paragraph-formatting, one typeface, and one font-attribute option), this limits you to a single format and style and does not help with other requester-based operations. ProWrite's macro directives need to be improved so that command settings can be passed to the program externally.

A Better Face Forward

Even though ProWrite is regarded as one of the most intuitive Amiga programs, New Horizons has improved its interface further. Now, virtually any editing change can be undone automatically (provided you undo it before you make another change). The optional guide ruler's margin and tab gadgets are now easier to select and move, and several new formatting icons let you quickly alter justification, tab types, and so on without accessing menus. Another slick addition is a font-preview window in the font-selection requester.

The program's packaging and documentation are also first rate. ProWrite 3.0 now ships in a hardcover slipcase, and its spiral-bound manual is well written, fully indexed, and nicely illustrated.

I commend New Horizons for its commitment to continually improve ProWrite, and despite my minor criticisms, I highly recommend version 3.0. In the future, I hope New Horizons will spruce up the macro and resident-font-printing features and complement the excellent graphics facility by adding full- and facing-page screen previews and simple tools for drawing lines and boxes.

ProWrite 3.0
New Horizons
PO Box 43167
Austin, TX 78745
512/328-6650
$175
No special requirements.

Update! At press time, we learned that New Horizons has just improved ProWrite's much maligned file requester. This new beauty lets you select device names by highlighting, cycling (backward and forward), or typing. Other enhancements we witnessed: An ability to speak text in various voices, and a customizable font submenu.

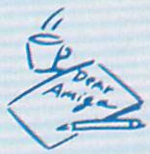
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B A C K T A L K

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

Two Against Three

I am much put out by DeluxeVideo III! (reviewed May '90, p. 12). How can Electronic Arts call this a professional program when it will not do true overscan? Everything I do is in 352×480, and for recent work I have used ANIMagic; DeluxeVideo III supports neither. I agree that the interface is nice, especially for those with CLI phobia. Without delivering professional results, however, it is as useless as Mindware's PageFlipper Plus FX, which produces professional output but has an interface that is meaningless to anyone unfamiliar with the CLI. ***—John C. Emery***
Melbourne, FL

Before buying DeluxeVideo III, I explained my requirements to an Electronic Arts representative, who wrote to assure me the program would fufill my needs. I had a series of problems, including system errors and lock ups, and found the customer support unresponsive. Deluxe Video III is good if you want to sync sound to video, do animated brushes, and put together interactive presentations—and you have the patience to do it on your own. But if you simply want to string a few graphics together in a professional-looking manner, you won't believe how something so simple can be made so complicated.

—Matthew Caldwell
Knoxville, TN

Get it Brite

"The Great Software Weigh-In" (Apr. '90, p. 24) is a great incentive to think multiplexically. The paint program stats chart, however, shows that Extra Halfbrite mode is not available in Deluxe PhotoLab (Electronic Arts). In truth, PhotoLab *can* handle it.

Kurt F. Faasse
Milton, NY

Oops . . .

In the PageSetter II review (June '90, p. 14), we editors made a couple of boo-boos. Not only did we misspell the name of the reviewer, Chris Dickman, but we introduced an error, referring to the utility that outputs PageSetter files in PostScript format as Gold Disk, which is actually the name of the manufacturer. The program is called LaserScript. Sorry, Chris.

Also, in our review of Progressive's FrameGrabber 256 and the Datel Video Digitizer (May '90, p. 78), we switched captions under the two screen photos.

Send your comments on reviews to Back Talk, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. ■

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New Disks

FD32: Game Cheats and Flight Simulator - Includes an instrument flight simulator for a DC10. Also Cheats and Hints for the following games, Shadow of the Beast, Earl Weaver great's, Falcon, It c.f.t.d., SimCity, SpaceAce, Space Quest, Test Drive hd install, and Extract a program that gets all of the text from within a game (or other) which helps cheating easier. Also several football teams (.team files)..
FD33: Arcade Games - Ffreddy a mario brothers type of game, Gerbils a target practice game, PipeLine a germany interpretation of Pipe Dreams, tron a light cycles version, and wetroids a wonderful version of asteroids with a hilarious twist.
FD34: Games - Includes WellTrix a derivative of the addictive game of tetris, Dot2Dot - the connect the dots to make a box game, and new version of BackGammon. Also included are several new "Schwabie type Hacks".
FD35 Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vain as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks or months.
Wb37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB39: Music - Intuitracker is an german offer of an exquisitely well done program that allows you to play Amiga music as if from a CD like controls. Lets you strip out music from your favorite games or others and include them in your music library. Strongly recommended for Amiga music lovers.
WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program.
DD64 Amiga Programers Manual - The fully comprehensive Amiga programing manual with source code examples and easy to understand tutorials!
DD65 C Tutorials - Several well done tutorials on how to program the Amiga. Includes tutorials and working examples on Device drivers, IFF reads and writes ,Sound implementation, Arcade game design and implementation, Double Buffering, and others. A must have for any serious Amiga Programer.
DD66 Programing ToolBox - Many programs to help in your development efforts (most for C, some for basic) Includes programs to generate requesters, an incredible spritemaker toolbox, to greatly aid compiling, convert DPaint brushes to C structures, a great library manager, and many more woderful time savers!

Other Great Disks -

FD5: Tactical Games - BattleForce(3.0) see MechForce on FD20. BullRun - a Civil war battle game, Metro - you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very good Amiga version of Kingdom, Golden Empire, Etc. Very very habit forming.
FD6: GAMES! - This disk is chalked full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD9: Moria - a very well done port of an UNIX based character adventure game. This has great graphic controls, multiple spells, similar to Larn and Hack. Takes up the whole disk. Play time several weeks!
FD10: HackLite - A dungeon adventure game. Considered a must have classic. This is the second release of this game on the Amiga. Originally a UNIX game. Great Amiga graphic interface. Fills the whole disk. Play time several weeks!
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arknoid/break out type game, Trix - a Qix type clone.
FD16: Strategy Games - Includes Diplomacy and Empros, both great conquer and rule multiplayer games similar in concept to Simcity and Populas. Also includes blackbox, hearts, and others.
FD17: Educational Games - This disk includes several games for the younger memebers including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.65); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim. This game is the full featured update to BattleForce(3.0) on FD5.
FD22: Arcade Games - This disk has MoonBase - The best lunar lander game we have seen in a long time, very challenging and addicting, Also BoingGame - a maze type, donkey kong type game.
FD24:Strategy Games and Others - Includes Dicey, a yathzee type clone, MM a master mind type clone, Flipper an othello type clone, China an great implementation of Shangi, CircutWars a challenging game based on electronics, and Etrain a computer based model train set construction set for the enthusiast.
FD25:Tactical Games - Empire (133w)Empire is a rich simulation of international politics, economics and war, which is played over a period of a few of months by 2 or more people. Players can run their countries from the normal Amiga keyboard, or via a modem at 300 to 2400 baud.
FD26:Arcade Games - Marble_slide, truly this is a commercial quality game. Similar to a Lucas game named PipeDreams, excellent playablitly and entertainment, Mutants , a small version of the arcade game of the same name, also SuperBreakout a pong/arknoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger.
FD28: Games! - This disk contains several great games including, DripGame - Sort of belongs to the PacMan type clone category but not exactly. This is truly a new and great original gaming idea. Very addicting, excellent playability, highly recommended. Pyramid - a Q-Bert type clone. Also, KingOil - a challenging board game were you are the leader of a wild cat oil team. Object - try and become another Exxon.
FD29: Shoot'em up's - WWII - your the pilot of a world war II plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD31: Games! - Air Traffic Control - a good ATC simulation game, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220 terminal emulator, and JRComm (0.94a) another great com program.
WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus(1.3).
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and much much more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts off file minipulation. A real must have!
WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, PrtDrvGen an easy to use program to make your own.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/schedular, a rolidex program, and pennywise a good "Cash Book" accounting for home or office.
WB18: Word/Text Processors - This disk contains the best editors that we could find. Includes, WordWright(v6.2) a full featured word processor with mail merge and outlining capacity, Dme(v1.35) a great programers editor with strong macro features, and TexED(v2.8) an enhanced Emacs type editor.
WB20: General Interest - On this disk is, DiskSalv V1.42 a disk recovery program for all Amiga file system, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook a program that gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of that image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, all aspects controllable,, BezSurf2 is a program for producing bezier surfaces of revolution. It produces awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages and VScreen makes a virtual screen anywhere. For you DTP people this is a absolute must have, it allows full page editing without redraws!
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any enter user global coordinate. . Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to help with harddisk and floppy disk backups, FileMast - a binary file editor much like NewZap, Lableprinter - a brand new Disk label printer with some of the most powerful features we have seen to date, each designed to give maximum control over what shows up on your labels.
WB27: Nagel - This disk contains 26 Patrick Nagel pictures of beautiful women.
WB28: Scientific - On this disk is MATLAB or MATrix LABoratory. this provides comprehensive vector and tensor operations.
WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractels from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything. Try this disk, you'll love it!
WB33:Circuit Board Design - several terrific routines for the electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD cad program, now comes with predrawn common circuit components for insertion into schematics.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models.
DD45: AREXX PROGRAMS - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.
DD47: Pascal - This disk contains everything needed to program in pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.
DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.
DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.
DD52: Scientific - This disk contains several great programs and C source routines for the scientist and science student. Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source FFT - fft C source.
DD54: Compression - This disk is loaded with ALL of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc(2.3), Lharc(1.0), Lhwarp(1.03), Pkax(1.0), PowerPacker(2.3a) a must have by all, Zip(1.0), Warp(2.04), and Zoo(2.0). Also IFFcrunch an excelent compression for IFF files.
DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide, and Conman (1.4). ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.
DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and visa versa, IconJ - a new improved IconX clone, KillAgnus - disables 512k of chip ram, Also several utilities that improve your startup-sequence, plus 25 more programs.
DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented programing language.

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A GREAT PERSONALITY

A NEW GIRL in town—**DEB 2000** ($75), or Denise Extender Board to her friends—lets you operate a flickerFixer with your A2000 or A2500 without tying up your video slot. With the flickerFixer out of the way, there is room for other devices such as internal genlocks and framebuffers. The board carries an FCC class B certification. With your flickerFixer behind the existing XT slots, DEB 2000 can transfer video signals from the Denise socket on the motherboard to the DEB connector board. (MicroWay, PO Box 79 Kingston, MA 02364, 508/746-7341.) *RS# 520.*

AND THEN SOME

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Because RGB levels differ slightly among Amiga models, the **Interlok** (NTSC, $569; PAL, $749) genlock features an internal selection system for addressing these variations. Interlok lets you alternate between 75 ohm and Hi-Z inputs, encoded video, key, and RGB out, and it allows fast forward and reverse search and pause. The unit's removable front panel lets you operate an overlay-fade control slider up to 25 feet away. (Spirit Technology, 220 W. 2950 South, Salt Lake City, UT 94115, 801/485-4233.) *RS# 560.*

Get two more video modes out of your Amiga and address color-contouring difficulties at the same time with **HAM-E** (Hold-And-Modify Expander) ($299.95). The REG mode provides 256 registered colors from a palette of 16 million in 24-bit format, and the HAM-E mode provides more than 262,000 colors simultaneously in 18 bits. Standard Amiga RGB monitors can display either mode. HAM-E's software supports Intuition, IFF, and ARexx. To install, just plug HAM-E into the RGB port and plug your genlock, encoder, and monitor into it. (Black Belt Systems, RR1, Box 4272, 398 Johnson Rd., Glasgow, MT 59230, 406/367-5509.) *RS# 505.*

Pulsar promises IBM PC/XT compatibility for your A500 with its **Power PC Board** ($498). The board gives your A500 704K of RAM and 64K Expanded Memory Specification and lets you use your serial, parallel, and mouse ports in PC mode. It comes with Microsoft DOS 4.01 and manuals, M/S DOS Shell, GW BASIC, and Learning DOS. The board also supports Hercules/CGA and Monochrome graphics and lets you switch back to Amiga mode without PC encroachment. PC Power fits into the A501 slot underneath the computer. (Pulsar, 410 Maple Ave., Westbury, NY 11590, 516/997-6903.) *RS# 506.*

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from five recent additions to Taito's lineup:

Beware of the danger that awaits you in Castle Eternity; it wants your essence. **Castle Master** compels you to rescue your twin from the evil within.

Or, cross over to ancient Egypt as the chosen prince in **Day of the Pharaoh**. Success depends upon your ability to accumulate great power while building an empire and a merchant fleet to trade with and explore distant lands.

On the lighter side, **Kiwi Kraze**, promotes non-violence while promising action and adventure. Tiki, a brave and lovable bird, needs your assistance to run, swim, leap, and scuba dive through 5 worlds and 20 levels in a madcap race to keep his companions off Wally the Walrus' dinner table.

Operation Thunderbolt, the sequel to Operation Wolf, features 3-D scrolling graphics and two-player capability. It pits you against the leadership of a hostile African nation. You must free 23 hostages to win.

For a strategic challange, **Puzznic** encourages you to piece geometric shapes together in any one of 144 different puzzles on 8 levels. As you advance, match multiple cubes for higher scores and faster action. (Taito Software, 267 W. Esplanade, N. Vancouver, B.C., Canada V7M 1A5, 604/984-3344.) *RS# 507.*

Connect with Pre'spect for either a **VGA-Y Switch Cable**, which allows interchange between the Amiga Video and VGA ports, or a **TTL-Y Cable**, which can connect both a standard Amiga monitor and a TTL monitor to one Amiga. Both cables are available for $79 each.

Do you need RAM expansion for your A2000? Could you also use a SCSI controller? You can have your cake and eat it, too, if you get **SRC4000** ($574) with 4MB of RAM. (Pre'spect Technics, PO Box 670, Station H, Montreal, Que., Canada H3G 2M6, 514/954-1483.) *RS# 508.*

Programmers, it is time to **ADAPT** ($119.95)! ADAPT—the Amiga Developer's Assembly Programming Toolkit—is a 68030 assembler that features a collection of tools for the assembly-language programmer. Included are an optimizing 680x0 macro assembler, a high-speed single-pass linker, an execution profiler, and a program analyzer. The assembler and linker are equipped with ARexx ports. (Lake Forest Logic, 28101 Ballard Rd., Unit E., Lake Forest, IL 60045, 708/816-6666.) **RS# 509.**

It all adds up. If you want to get a good foundation, you have to go Back To Basics, which, by chance, is the name of a series of skill-building drill programs in math and language. The five-part set, including **Long Multiplication** ($35), **Long Division** ($35), **Long Addition/Subtraction** ($30), **Say N'Spell** ($30), and **Word Construction Set** (price unavailable), aims for step-by-step progression. The series features visual and aural assistance along the way.

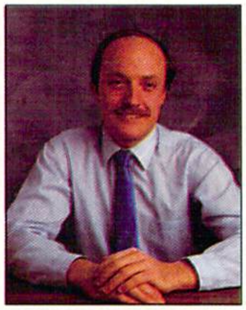
For those of you who appreciate the finer things in life, **Fine Art Paintings** introduces you to Early and High Renaissance works, The Quattrocento, the Impressionists, and Venetian art. A two-disk set of musical accompaniment ($20) includes Gregorian Chant, Plainsong, Renaissance Dance, and Palestrina tracks. (Lascelles Productions, PO Box 959, Hastings, New Zealand, 070-89652, fax: 070-89652.) *RS# 510.*

MathVision ($197), a math- and science-visualization program, offers a panorama of gadgets, controls, and functions to help you explore mathematical objects and scientific data sets. Features include data input/graphics output, HAM, Overscan, Halfbrite, and ARexx support, and it hooks to access external programs. Upgrades for owners of Doug's Math Aquarium are available for $30. (Seven Seas Software, PO Box 1451, Port Townsend, WA 98368, 206/385-1956.) *RS# 511.*

If writing high-speed graphics applications is your game, **Blitz BASIC** was written with you in mind. The compiler features support for all Amiga graphics modes and control over Blitter and Copper co-processors. Features include menu access to program sections, auto-backup options, full control over compiler parameters, and a new, interleaved bitmap structure requiring only one blit for a 32-color shape. (M.A.S.T. 139 Greg St. #106, Sparks, NV 89431, 702/359-0444.) *RS# 512.*

ACAD Translator 2.0, an enhancement to the DFX file-conversion utility, includes full AutoCAD (AutoDesk) release 10 support, extrusion direction other than in the Z axis, mesh, standard, and spline support. The stepped-up version also allows you to directly enable or disable all layers beyond 16. Access Technologies promises increased ease of use, with support for MS-DOS-file carriage-return line-feed format and an improved window requester color scheme. (Access Technologies, PO Box 202197, Austin, TX 78720, 512/343-9564.) *RS# 513.*

Pilot an F6F Hellcat fighter/bomber through a series of bombing and fleet-defense missions over the Pacific. You may be prevailed upon to storm enemy bunkers and machine-gun nests, or attack enemy warships while fighting off swarms of nimble enemy fighters. **Wings of Fury** ($39.95) features digitized sound effects for bombs, gunfire, and airplane engines. (Broderbund Software, 17 Paul Dr., San Rafael, CA 94903, 415/492-3200.) *RS# 514.* ■



HORS D'OEUVRES

Hints, tips and techniques from your fellow Amiga users.

Compiled by Tim Walsh

Less Typing = Less Pain

SOMEONE RECENTLY ASKED on a local Amiga BBS if there was a way to use the CLI to copy a file and its accompanying filename to the current directory without typing the filename twice. To my surprise, no one seemed to know how to do it, but there is a way. If you need to copy a file from DF1 to DF0, instead of typing:

```
COPY DF1:A_Lengthy_Filename
  TO DF0:A_Lengthy_Filename
```

make certain the current directory is DF0 and type:

```
COPY DF1:A_Lengthy_Filename
  TO ""
```

This process can be used to copy entire directories to the current directory, as follows:

```
COPY DF1:My_Directory TO ""
```

Of course, the "TO" in all of the above examples is optional.

Robert Bequette
Fair Oaks, CA

Lighten Up

DOUBLE-PASS PRINTING, favored by many Amiga computerists for darkening their printouts, doesn't work well with dark screen images, because lighter colors are indistinguishable. By making use of NewTek's Digi-Paint 3, you can make a dark image lighter in these few easy steps:

1. Place an image on the Digi-Paint screen.
2. Select the Lighten option from the Mode menu.
3. Select the Fill and Box drawing tools from the Tools menu.
4. Draw a box over the selected area of the image and it'll lighten when the mouse button is released.

As an alternative, a bright screen image can be made darker by substituting Digi-Paint 3's Darken Mode in the above process.

Campbell Lee
East Ryde, NSW, Australia

Commodore to Amiga Magic

WITH MORE AND more Commodore 64 and 128 owners upgrading to Amigas, I thought I'd pass along a few tidbits for making Amiga-compatible files from those created on Commodore 8-bit computers.

To convert any files created on the 8-bit machines, you must first save them as sequential files. Most word processors offer the option of saving files in sequential format. In the case of Basic programs, remove all embedded cursor-control codes and screen codes, and then save them to disk using the command line:

```
OPEN 8,8,8,"filename,s,w":CMD8:
  LIST:PRINT#8:CLOSE8
```

If you have two modems, upload these files from your Commodore 8-bit to your Amiga. If you don't have two modems or a Commodore 1581 disk drive, find someone—perhaps in a local user's group—who's willing to lend you his 1581 drive so you can copy the files to 3.5-inch Commodore format. You can then use an Amiga disk utility such as ReadySoft's Transfer program to copy the Commodore 8-bit format files to Amiga format. Transfer also allows you to convert Commodore text files into ASCII text files. With practice, you'll be able to get all of your important documents and many Basic programs into Amiga-compatible files.

Chuck Brouillee
Andover, MA

CD and DIR Shortcut

CHANGING TO A new directory and displaying its contents from within the CLI or Shell usually involves a considerable amount of typing. You must first change the directory via the CD command and the name of the new directory, and then enter the DIR command. To reduce typing, I used a text editor to create the following script file that not only changes the directory, but also lists it:

```
.key DIR
CD <DIR>
DIR
```

You can then save this file to your Workbench's C directory as "CDir" and make it into an executable file by issuing the following command:

```
Protect CDir +s
```

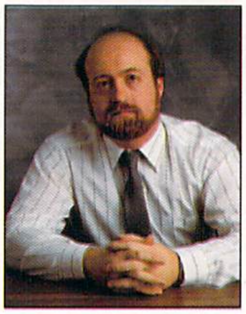
To use CDir, just type:

```
CDir:directoryname:pathname
```

This displays the name of the selected directory, followed by a directory listing of its contents. If you specify no directory name, CDir will display the name of the current directory and its contents.

Craig Buchek
St. Louis, MO

Editor's note: This is the last edition of Hors d'oeuvres, which is about to die a sacrificial death so that a new department may be born. To better serve our readers, we will introduce in the October issue a new column devoted to public domain software. Stay tuned for a lot of useful information on available free programs and shareware! ■



HELP KEY

As the very OS shifts beneath your Workbench, cling to Lou to carry you through.

By Louis R. Wallace

DISPLAY AND EDIT

Q: *I heard that Workbench 2.0 can have much larger screens, even bigger than the new Productivity 640×480 and Super Hi-Res 1280-bit wide modes. Is that true? Can the Productivity and Super Hi-Res modes be genlocked? I understand Productivity mode is only four colors, just like the regular Workbench screen. Can I use the other screen modes as Workbench displays and have more than four colors? Also, has Commodore dumped ED, that horrible text editor?*

J. Wilton
Topeka, KS

A: Yes, you can define very large screens for Workbench. Called virtual Workbench screens, they are much larger than what your Amiga can display on the monitor. Their maximum size depends on how much regular RAM and chip RAM you have. (For example, I created a 1024×1024 display on my A3000.) If you select the AUTOSCROLL option, the Workbench display automatically scrolls to show another portion of the virtual screen whenever you bring the pointer to the edge of the display. Virtual screens allow you to have many windows open, as well as enlarge the work space of applications that run in the Workbench environment, such as desktop-publishing programs.

While you cannot genlock Productivity mode, you can use Super Hi-Res mode with a genlock. In fact, Super Hi-Res is perfect for such video applications as titling, because the large horizontal resolution almost eliminates the "jaggies" so common in hi-res mode.

Productivity and Super Hi-Res modes are limited to two or four colors and have severe palette restrictions, as well. Because of the way the displays are generated, their palette consists of only 64 possible colors, instead of the normal 4096. If, however, you decide to use one of the regular display modes, such as hi-res (either 640×200 or 640×400), you can use from two to 16 colors for Workbench. All resolutions work in overscan mode.

As for ED, I have good news. The old ED is gone, replaced by a new and improved ED that offers full mouse and menu control. It isn't a word processor, but it certainly is not a dinosaur like the original ED. I suspect lots more people will find it useful. For more information on 2.0, watch for our series of articles starting in the November 1990 issue.

VIDEO FOR VISION

Q: *AmigaVision sounds great, but do you need a genlock and a laser-disc player to use it? If you do, it's useless to most of us! Will it work under 1.3, or does it require Workbench 2.0? Also, how much does it cost, where can I get it, and does it have a player program (such as The Director's Projector utility) that lets people who don't own AmigaVision use the applications created with it?*

A. Cottrel
Marietta, OH

A: No, you *do not* need a laser-disc player or a genlock for AmigaVision. AmigaVision works just fine without them, allowing you to create incredible interactive applications in 1.3 or 2.0 using standard Amiga graphic, animation, sound, and text files. If you do have a genlock and laser-disc player, AmigaVision fully supports their use. It does not have a player program, however, so you need a copy of AmigaVision to use its applications. This isn't as bad as it sounds, because Commodore expects most people to get AmigaVision. It comes bundled free with new machines and is available separately from Amiga dealers for a suggested retail price of $149.95. Never fear, it will probably be heavily discounted.

NO CHANGE

Q: *Do I have to use a multisync monitor with the A3000, or can I use my old A1080 monitor? I was thinking about upgrading from my A2000, but I don't want to buy a new monitor.*

S. Adams
New York, NY

A: The multisync is optional. The A3000 has a standard RGB port that you can use if you want. To take advantage of the flicker-removing display enhancer or the new Productivity mode, however, you will need a multisync.

DON'T BELIEVE IT

Q: *I don't plan on buying an A3000, but I do want the new OS for my A500. My dealer told me that Commodore doesn't plan on releasing a version of Workbench 2.0 for A500 owners! Is that true? If so, why are they limiting it to the high-end machine? Can't the A500 use at least part of the new Workbench?*

N. Zakora
West Palm Beach, FL

A: I, too, had heard those rumors, which conflicted with what I was told by Commodore earlier. So, at the June Consumer Electronics Show, I caught up with Jeff Scherb, who heads CATS (Commodore Amiga Technical Support). According to Jeff, the rumor has no truth. The new Workbench 2.0 will be available to both A500 and A2000 owners. To take full advantage of the upgrade, however, you need more than a new Workbench disk. You need a 2.0 Kickstart ROM (512K instead of 256K) and the new Super Agnus and Super Denise chips. This means the 2.0 Enhancer package will probably mean a trip to a service center. No release date or price for the upgrade yet, but I'll let you know as soon as I find out. ■

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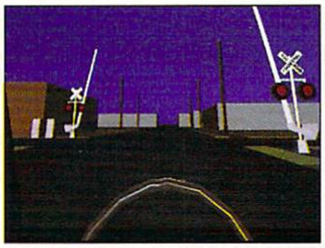
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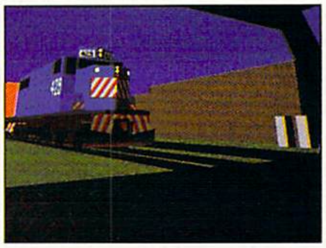
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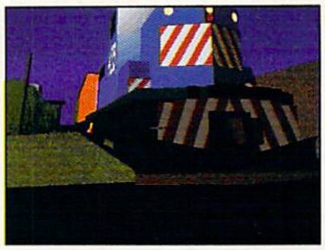
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AMIGA PROFILE

Night Fright







From behind the wheel. . .1, 2, 3 crash.

CRUISING ALONG AT about 30 mph on a dimly lit back road, a car approaches a railroad crossing. Seeing no crossing gate and hearing no whistle, the driver continues. Suddenly, a freight train barrels down the track. Brakes squeal and seconds later, car and train collide.

No, this is not last night's nightmare—it's an Amiga-generated accident reconstruction being presented as evidence in court. Miami-based Rick Rodriguez and his Amiga were hired by the plaintiff to try to demonstrate that the Railroad was negligent: The crossing gate did not warn the driver of the oncoming train.

As in all court battles, there is another side to the story. The Railroad claims the driver went around the closed crossing gate. But, if he did swerve around the gate, Rodriguez argues, surely the car would have hit the train from at least a thirty-degree angle. Using his Amiga and the accident report, Rodriguez attempts to demonstrate that the car and the train hit at about a ten-degree angle; therefore the car went straight through the railroad crossing.

Rodriguez began reconstructing the accident with Turbo Silver (Impulse) and spent two weeks inputting the geometry of the accident site. He drew each street, building, intersection, and vehicle from three perspectives. From one vantage point, the jury is placed behind the wheel with as much time to react as the driver had. The other two shots are aerial views spotlighting the angle of collision.

These three perspectives recreated the seconds before, during, and after the collision. Though Rodriguez used Turbo Silver to reconstruct the accident up until the moment of impact, he drew the crash frame by frame using DeluxePaint III (Electronic Arts). To animate the crunch, he used Animation Station (Progressive Peripherals).

Rodriguez also switched from Turbo Silver to DeluxePaint III to draw a countdown clock. With DeluxePaint III, he merely typed in each 100th of a second. Using Animation Station he then superimposed the countdown onto the Turbo Silver animation.

Rodriguez's animation was both detailed and fluid because each frame lasted .003 seconds and each second contained thirty frames of animation. Because each of the three viewpoints were six seconds long, he used a total of 540 frames of animation.

Rodriguez used an Amiga 2000 equipped with 8MB of RAM and a GVP 68030 Accelerator board. The eight megs allowed him to handle the 540 frames of animation, and with his accelerator board, he could access the frames at the desired speed of .003 seconds per frame. Without this board, the reconstructed accident would not have occurred in the correct time frame.

Although the outcome of the case is not yet known, one verdict is already in—Amiga animations are not only for fun and games. You had better believe the Railroad isn't laughing!

—Carla Barker

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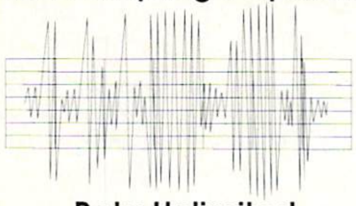
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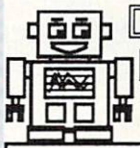
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LAST LICKS



"HE USED TO BE AN AWESOME PIRATE UNTIL A LARGE CORPORATION BROKE INTO HIS SYSTEM AND DELETED ALL OF HIS BOOK REPORTS."

Silicon. . .Cow Chips?

First we broke the A3000 story. Then our investigators got the skinny on CDTV and shipped the story to you on the day of announcement. This month we've got another exclusive. John "Green" Acres, gentlemen farmer and chairman of the colossal MYBM Corporation, granted *AmigaWorld* an exclusive interview about MYBM's future PC plans. According to a senior level MYBM PR stooge, Acres mistakenly thought *AmigaWorld* was the Mexican version of *PC World.*

Acres: ¿Qué Pasa?

AW: *Yeah, sure. What are IBM's PC operating systems plans?*

Acres: We are moving aggressively and already have some superior technology such as multitasking, menus, and also the ability to run some really large applications. Our goal for the next decade is to bring the price down to the point where even the upper middle class can afford it.

AW: *And what about hardware?*

Acres: This you are just not going to believe. Over the next five to ten years, we plan to develop PCs with special processors for special things. We are considering a chip to handle audio output and interfacing to floppy disk drives. We've also kicked around the idea of a "bit blitter." This blitter stuff will really make graphics and windowing move. Wait till you see it!

AW: *Wow. That's pretty incredible. Anything else?*

Acres: Sure. We are also going to build in stereo sound, speech synthesis, and NTSC compatibility. Once we do that, nobody will touch us.

AW: *I hear Commodore has a machine just like that already.*

Acres: Commodore? Don't make me laugh. By the way, are you translating this into Spanish?

—Doug Barney

Ear to the Wall

Photo Finish? Our non-Commodore sources report a neck and neck race between Commodore and Hewlett-Packard for the premier 68040 device. Be on the lookout for one of these firms to kick out the 68040 around October.

That's not all these two firms have in common, according to our sources. It seems HP is devising a Unix-oriented Multimedia strategy and is using the Amiga as its paradigm. HP is reportedly working with several third parties on multimedia peripherals (can you say "genlock"?) and is even devising an authoring system. Now there's a novel approach.

New deal. Prospective UltraCard owners might like to make themselves a note that Intuitive Technologies, developer of Amiga multimedia software, is in the process of turning over sales (including upgrades) and technical support to its new distributor, mediaMAXX (800/456-6299). MediaMAXX offers UltraCard ($50) and UltraCard Plus ($100), along with multimedia consulting and services.

Maxiplan 3.0 watchers may be treated to the product very soon. Intuitive Technologies has been negotiating for a distributor, and something should be in place by the time you read this.

What a Pal! Brown-Wagh is offering free upgrades for registered owners of SoftWood's word processor, Pen Pal.

Also, the jungle drums say that Brown-Wagh is working on another word processing project that's scheduled for release sometime late this year.

In other news, we understand that Emerald Intelligence has shipped free Magellan upgrades to registered users and has reduced the price of its Interface Toolkit from $75 to $45.

TI attention. The Lowell board, which is based on Texas Instrument's TI 34010 graphics processor and is currently under development at the University of Lowell in Massachusetts, was seen running X-Windows on top of a photo-realistic image at Spring Comdex. Our sources report a fall release date.

Welcome aboard. Atari founder Noland Bushnell made a splash debut at the last Consumer Electronics Show as Commodore's latest acquisition of high-level talent. You may recall that one of his inventions from 1972 was Pong, the very first video game released in the US. His role at Commodore, Consumer Interactive Products General Manager, will keep him quite busy, we think.

TIP OF THE MONTH FROM AMIGA WORLD

The TYPE Command

Another informational command is TYPE, which lists the entire contents of a file. From the CLI, this command simply types the contents of the file into your CLI window. For example, with your workbench disk in the internal drive, from a CLI issue the command:

TYPE df0:s/startup-sequence

Continued on other side

You can use TYPE to display the contents of any file.

NOTE: If you use TYPE to display the contents of a file containing any non-ASCII characters, they may cause your screen to flash and strange things to appear. You should limit your use of TYPE to files that you know for certain contain only text material.

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26	31	36	41	46	226	231	236	241	246	426	431	436	441	446
27	32	37	42	47	227	232	237	242	247	427	432	437	442	447
28	33	38	43	48	228	233	238	243	248	428	433	438	443	448
29	34	39	44	49	229	234	239	244	249	429	434	439	444	449
30	35	40	45	50	230	235	240	245	250	430	435	440	445	450
51	56	61	66	71	251	256	261	266	271	451	456	461	466	471
52	57	62	67	72	252	257	262	267	272	452	457	462	467	472
53	58	63	68	73	253	258	263	268	273	453	458	463	468	473
54	59	64	69	74	254	259	264	269	274	454	459	464	469	474
55	60	65	70	75	255	260	265	270	275	455	460	465	470	475
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177	182	187	192	197	377	382	387	392	397	577	582	587	592	597
178	183	188	193	198	378	383	388	393	398	578	583	588	593	598
179	184	189	194	199	379	384	389	394	399	579	584	589	594	599
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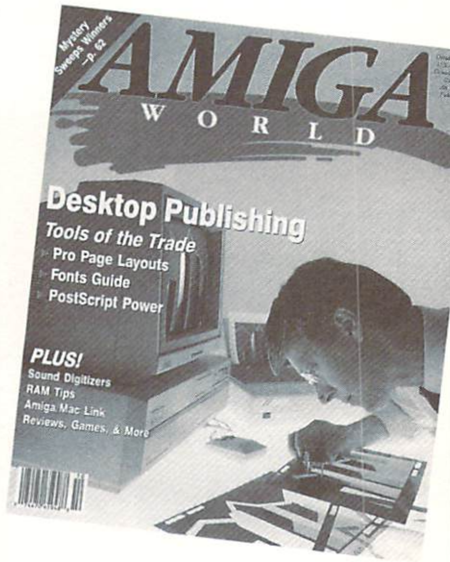
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